Washington State

Asthma Plan

Washington Asthma Initiative

November 2005

AMERICAN LUNG ASSOCIATION®
of Washington

Washington State Department of Health

November, 2005

Dear Asthma Champion,

According to the recently released 2005 *The Burden of Asthma in Washington State* report, asthma is a disease that affects the lives of more than 520,000 individuals in Washington State. No segment of society is unaffected and children are disproportionately impacted by this disease.

The *Washington State Asthma Plan* is an important step in the mobilization of individuals, communities, and organizations throughout Washington State to improve the prevention, diagnosis, and management of asthma and its many burdens. This plan represents the hard work of hundreds of volunteers and organizations who have joined in commitment to this goal. The framers of the state Asthma Plan hope that it will become an important addition to your work in improving the lives of those with asthma.

We thank the broad coalition of experts from many sectors who worked with the Washington Asthma Initiative to create this plan, including state and federal agencies, educational institutions, nonprofit organizations, local health departments, and private industry. It provides our state with a wide range of public health opportunities with clear objectives and practical materials. It represents the very best in public health planning.

How will we know if we are successful? It will be a success, when hospitalizations decrease and death rates decline; when policies are implemented to protect vulnerable populations and promote state of the art clinical and environmental practices; and when every fiber of our society is tuned to respond to the complexities of managing this chronic disease.

Our work has only just begun. This plan demonstrates that we can achieve great things if we continue to work together using both traditional and innovative approaches, to help Washington communities be healthy and Washington residents live healthy lives.

Please accept our heartfelt appreciation for all the time, effort and resources committed to the preparation of this report. Now, we must act with equal vigor to implement the plan in order to change the lives of those who live with asthma.

Sincerely,

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The Washington Asthma Initiative mobilizes individuals, communities, and organizations throughout Washington State to improve the prevention, diagnosis, and management of asthma in order to decrease its individual and societal burdens

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Introduction

The Washington Asthma Initiative (WAI) has been a leader in forming recommendations and coordinating health care providers from varied backgrounds to work towards improving the prevention, diagnosis and management of asthma in Washington State. WAI is joined by the American Lung Association of Washington, the Washington State Department of Health and key stakeholders from around the state in the development of a statewide asthma plan. The Washington State Asthma Plan is not that of the State Department of Health but that of the citizens of Washington State.

The plan was coordinated by Amy Manchester Harris, Asthma Program Manager for the Washington State Department of Health and supported by a grant from the Centers for Disease Control and Prevention (U59/CCU025030-01). The Department of Health was funded to assist in the development of a state plan.

How to Read this Plan

Asthma is a complex problem which has many overlapping issues. The plan has been designed to address these issues. There are six chapters are designed to cover the following core areas:

- Asthma: A Comprehensive Approach (Community-based activities);
- Health care,
- Asthma and the Environment;
- Asthma in Educational Settings;
- Work-Related Asthma; and
- Cross-cutting Issues

These chapters describe the overall issues of asthma as it relates to the topic areas, current activities to address asthma in Washington and outline objectives and strategies.

The following chapters are designed to be supportive or stand completely separate from the document:

What is Asthma? Chapter

Designed to accompany the other chapters of the plan serving as the core foundation to describe asthma.

Executive Summary

Designed to be a short overview of the state plan and includes the goals and objectives

Special Thanks

The plan reflects the good thoughts and work of many who volunteered their own time, took time out of the work lives to provide their expertise and thoughtful comments. This plan could not be accomplished without that commitment. Individual workgroup members are listed at the end of each of the chapters.

In particular the following organizations, programs, workgroup members provided large support for the plan's development:

- American Lung Association of Washington
- Yakima Valley Farm Workers Clinic
- Department of Health's, Epidemiology, State Asthma Program, Steps to a HealthierUS, and Environmental Health Program
- Office of the Superintendent of Public Instruction
- Department of Labor and Industries
- Department of Social and Health Services
- Department of Ecology
- University of Washington
- Harris and Smith Public Relations
- Members of the Asthma Plan Project Team (listed below)

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Executive Summary

Asthma is one of the most common chronic diseases worldwide, and an important health issue in our state.

Unmanaged Asthma Can Impact Lives

Unmanaged or undertreated asthma can increase missed school or work days and disrupt sleep. Symptoms can interfere with physical activity.

Most Hospitalizations Are Preventable

Proper medical care, routine monitoring of lung functions using a peak flow meter, adherence to medication and avoidance of asthma triggers can eliminate trips to the hospital.

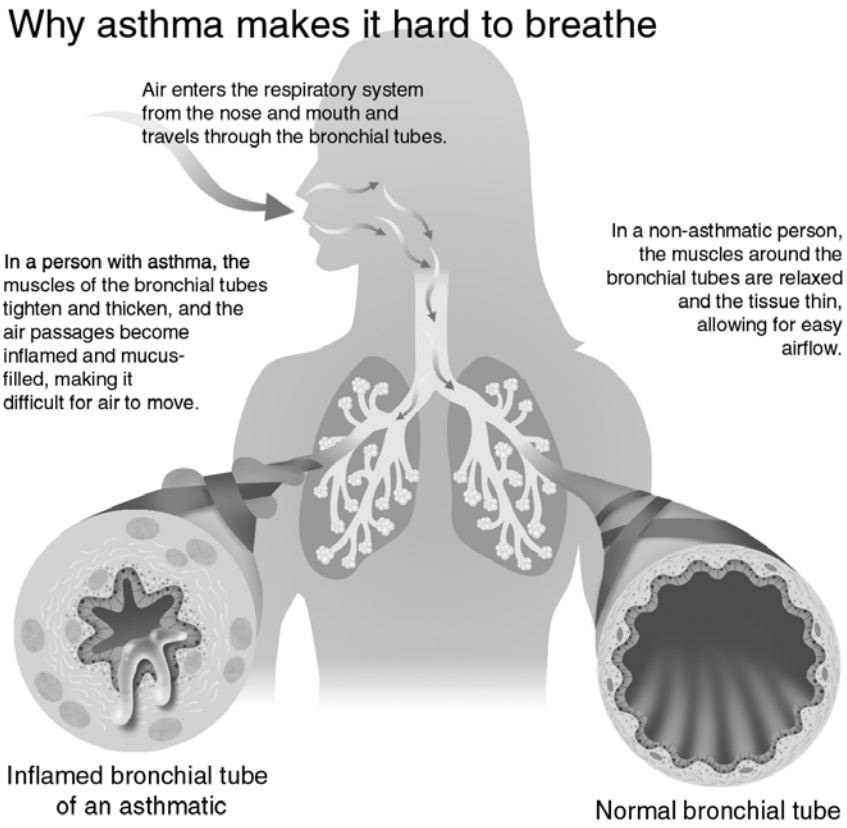
Access to Medical Care and Trigger Reduction are Critical

Supporting access to medical care and the reduction of asthma triggers in public settings is important for people to manage their asthma.

Effectively Addressing Asthma Requires a Coordinated Approach

A long-term coordinated and multifaceted approach is required to improve outcomes for all persons with asthma. This is only accomplished through attention to equity and the most efficient use of resources.

Asthma is



Washington State Asthma Rate Among the Highest in the US

400,000 Washington adults & 120,000 youth currently have asthma

1 in 10 households with children have a child with asthma

Nearly 100 people die in Washington every year as a direct result of asthma

More than 5,000 people are hospitalized every year because of asthma

Asthma costs more than $400 million every year in medical expenditures and lost productivity

Over 75% of adults and youth with asthma reported they had asthma symptoms during the past month.

Half of adults and one-third of youth with asthma reported having trouble sleeping because of their symptoms.

Airway Obstruction
A blockage of an airway that is generally reversible either on its own or with treatment

Airway Inflammation
Swelling of the airways which can reduce the amount of air flowing to and from the lungs

Airway Hyper-responsitivity
An exaggerated narrowing of the airways which limits airflow in response to a wide variety of stimuli, including allergens/ asthmagens, environmental irritants, viral infection, or exercise.

Washington Asthma Initiative Steering Committee Members

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Development of the Washington State Asthma Plan

The Washington Asthma Initiative (WAI) has been is a statewide coalition of health providers, lung health advocates and public health professionals formed to make recommendations and provide coordination improve the prevention, diagnosis and management of asthma in Washington State. WAI is joined by the American Lung Association of Washington, the Washington State Department of Health (DOH) and key stakeholders from around the state in the development of a statewide asthma plan. Through the WAI the Washington State Asthma Plan reflects the input and needs of the citizens residents of Washington State supported by the expertise and resources of DOH.

Seven workgroups were established to create the State Asthma Plan:

1. Community-Based Activities
2. Data & Surveillance
3. Environmental & Occupational
4. Healthcare & Practitioner Support
5. Policy & Advocacy
6. Communication & Coordination
7. Asthma Plan Project Team (APPT)

The workgroups were charged with making recommendations on outcome-based strategies that:

- Empower the individual to have adequate control over his/her asthma
- Improve the care of people with asthma
- Limit potential asthma triggers in the environment
- Improve local and state infrastructure for prevention and treatment of asthma

Asthma Plan Recommendations

Community Based Activities (CBA)

Asthma is an issue that deeply affects individuals, families, schools, child care providers, health care providers and the community.

CBA Goal 1: Improve the understanding and management of asthma as both a personal and public health issue for persons with asthma and their families, policy makers, and the general public in Washington State.

Objectives:

- By 2010, increase the understanding of asthma through asthma awareness programs and education in Washington State
- By 2010, implement at least 50% of the prioritized objectives of the Washington State Asthma Plan
- By 2008, identify community asthma educational needs for community programs serving children (including child care providers), adults and the older adults, their paid and unpaid caregivers and underserved populations within Washington State
- By 2010, increase the number of community-based programs serving youth (e.g., youth day camps, summer camps, sport leagues) and older adults which report utilizing asthma management plans and have asthma-friendly policies in place

Health Care (HC)

The role of the health care practitioner is to work with persons with asthma to control their disease and prevent it from interfering with daily life. When an exacerbation of asthma occurs, disease management becomes urgent.

HC Goal 1: Provide all persons with asthma access to quality asthma care in Washington State.

Objectives:

- By 2010, Washington State will utilize public health and medical care approaches to reducing the burden of asthma through increased access to health care service delivery statewide
- By 2010, people with asthma in all areas of the state will receive quality asthma care from health care practitioners with current expertise in managing asthma

HC Goal 2: Promote optimal patient care of all persons with asthma through seamless and timely tracking of asthma care service utilization statewide.

Objective:

- By 2010, a comprehensive surveillance and monitoring system will be in place in order to assess asthma care in Washington State

HC Goal 3: Assure health care practitioners and health care delivery systems will provide high quality care that follows national and state guidelines.

Objective:

- By 2010, at least 80% of health care practitioners will deliver asthma care that follows national and state guidelines

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Asthma Plan Project Team

A special committee appointed by the WAI steering committee provided overall plan guidance and direction to the five committees in developing a statewide strategic plan to address the increasing health and economic burden of asthma in Washington State.

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HC Goal 4: Continuously monitor changes in the field of asthma care and incorporate as appropriate.

Objectives:

- By 2006, develop a statewide communication system for new information and research about asthma care
- By 2010, explore the role of complementary and alternative medicine (CAM) in asthma care on an ongoing basis

Asthma and the Environment (AE)

Environmental exposures play an important role in asthma management. The main factors responsible for causing asthma exacerbations and persistent symptoms are exposure to allergens, irritants, and viral respiratory infections.

AE Goal 1: Assure a safer and healthier environment for persons with asthma in Washington State.

Objectives:

- Through 2010, assess prevalence of exposures to environmental asthma triggers
- Through 2007, conduct a targeted needs assessment to identify educational needs of the public on environmental asthma triggers
- Through 2010, increase awareness among Washington State residents of the significant impact of indoor and outdoor environmental factors in the development and management of asthma
- Through 2010, raise awareness among housing and building professionals including architects, building engineers, construction contractors, building owners/managers and maintenance staff about exposures in the environment linked to the development or worsening of asthma
- Through 2010, decrease exposures in the indoor (car, home, schools, child care, etc.) and outdoor environment that can worsen asthma or lead to asthma development

Asthma in Educational Settings (AES)

Asthma, especially under-treated or untreated asthma, can hinder a child's ability to attend, participate and learn in school or child care programs.

AES Goal 1: Increase the number of 'asthma-friendly' schools in Washington State.

Objectives:

- By 2010, increase the number of schools reporting implementation of emergency care plans for all identified students with asthma
- By 2007, expand asthma-related school-based data collection systems in Washington State
- By 2010, increase the number of schools that report utilizing an evidence-based school environmental assessment program

Work-related Asthma (WRA)

Work-related asthma is a significant and preventable public health problem and is considered a priority condition in the National Occupational Research Agenda by the Centers for Disease Control and Prevention.

WRA Goal 1: Reduce work-related asthma in Washington State.

Objectives:

- Through 2010, increase education of asthmagens and asthma triggers in the workplace among physicians, employers, and employees
- Through 2010, decrease worker exposure to asthmagens and common asthma triggers in the workplace

Health Disparities (HD)

Although asthma affects Americans of all ages, races, and ethnic groups, low-income and minority populations may experience substantially higher rates of fatalities, hospital admissions, and emergency department visits due to asthma

HD Goal 1: Reduce health disparities related to asthma in Washington State.

Objectives:

- Through 2010, minimize communication barriers due to language and cultural differences by translation of education materials into a variety of languages and culturally appropriate outreach strategies
- Through 2010, increase the Washington Asthma Initiative's knowledge of the needs of health-disparate communities
- Through 2010, increase data sources that capture race/ethnic data in Washington State

Data and Surveillance (DS)

The purpose of a surveillance system is to monitor trends in the disease and its management in order to prevent or better control it within the population. Asthma surveillance is a critical component of public health efforts to address asthma.

DS Goal 1: Analyze public health surveillance data and describe asthma prevalence and impact within the Washington State population.

Objective:

- Through 2010, conduct descriptive epidemiologic analyses to characterize the distributions of asthma prevalence, morbidity, and mortality in Washington State

DS Goal 2: Support planning and evaluation of goals and objectives within the Washington State Asthma Plan.

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Objectives:

- Through 2010, develop a data collection plan that reflects the priorities within the State Asthma Plan and provides data at timely intervals for objective development or objective evaluation
- Through 2010, identify existing resources, opportunities and models that may fill data gaps to be identified by data and surveillance stakeholders in the State Plan process

DS Goal3: Provide data to our stakeholders on a routine basis, in easily accessible and understandable formats, to support communication about the importance of addressing asthma as a priority in public health.

Objectives:

- Through 2010, disseminate (up to 4 times per year) new data findings through short reports in a newsletter
- Through 2010, disseminate an updated "Washington State Asthma Burden Report"
- Through 2010, continue to meet with asthma stakeholders to identify key questions and priorities to include when planning data collection and analyses

Policy and Advocacy (PA)

Asthma is a national problem which requires multidimensional policy actions within and among private and public agencies at the local, national and federal level.

PA Goal 1: Advocate and support polices that improve the quality of life for persons with asthma in Washington State.

Objectives:

- Through 2010, support smoke-free policies in Washington State
- Through 2010, promote requirements for construction and maintenance of public buildings (including school buildings and state and local offices) that promote clean indoor air and prevent "sick buildings"
- Through 2010, support policies that promote clean outdoor air in Washington State
- Through 2010, increase the number of school-based asthma/asthma-related policies
- Through 2010, support local asthma coalitions in policy advocacy in their local communities
- Through 2010, support policies to promote access to appropriate health care

Partnering to Address Asthma

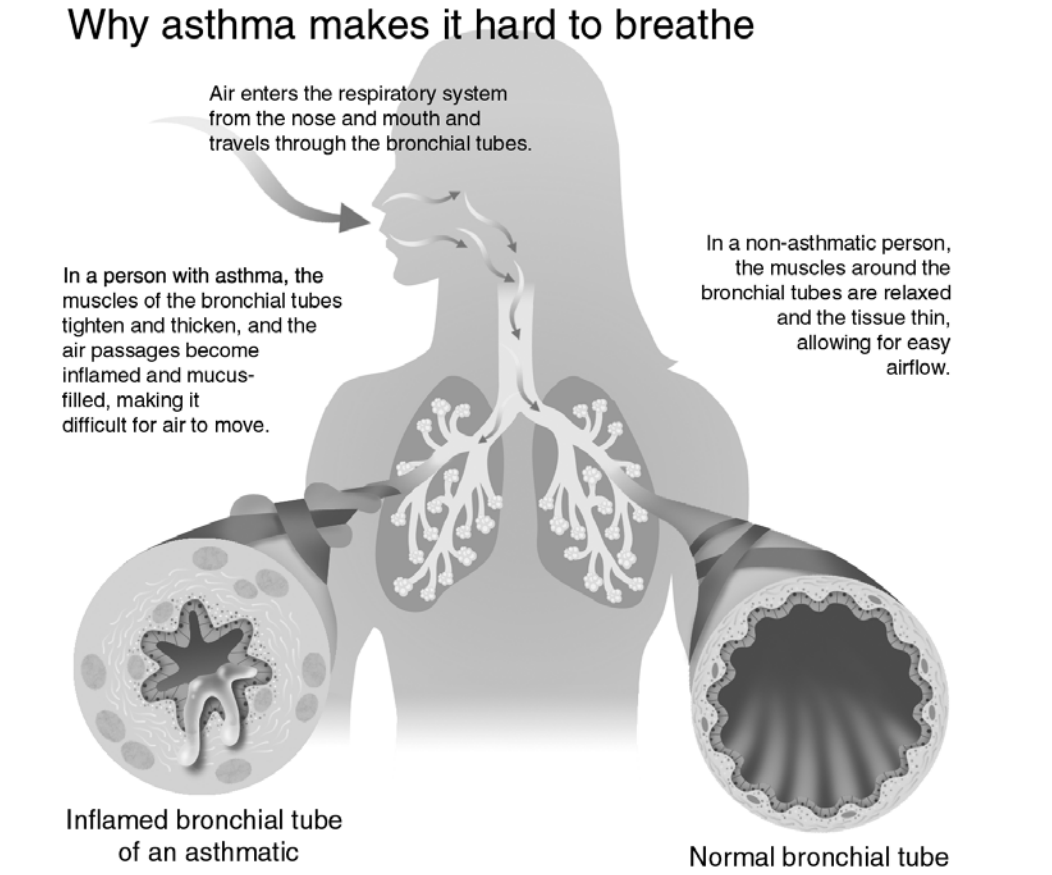
Reducing asthma at the individual and societal level requires the interest and assistance of all people, not just those affected with asthma and their families or health care providers.

To get involved in addressing asthma or obtain more information: go to the WAI website, www.alaw.org/asthma/washington_asthma_initiative

What is Asthma?

Asthma is a chronic inflammatory disorder of the airways. It is defined by the American Thoracic Society as a disorder with the following characteristics, not all of which need be present to assign the diagnosis of asthma

- Airway Obstruction - A blockage of an airway that is generally reversible either on its own or with treatment
- Airway Inflammation - Swelling of the airways which can reduce the amount of air flowing to and from the lungs
- Airway Hyper-responsitivity – An exaggerated narrowing of the airways which limits airflow in response to a wide variety of stimuli, including allergens/asthmagens, environmental irritants, viral infection, or exercise[1]



Asthma can range from being an intermittent nuisance triggered by specific factors, such as allergen exposure or exercise, to being a severe, progressive, and occasionally fatal disease without apparent external cause. This diversity has led to a growing appreciation that asthma, as currently defined, probably is not a specific disease, but a syndrome with multiple causes leading to reversible airway obstruction.

1 Centers for Disease Control. (2004). Pathophysiology. In *National Asthma Training Curriculum* [CD-ROM]. Centers for Disease Control.

2 *American Academy of Allergy, Asthma & Immunology Website.* Retrieved August 4, 2005. http://www.aaaai.org/media/photographics/illustrations.stm

Exacerbating Factors

Allergens, irritants or other triggers that can cause asthma symptoms to worsen.

Allergens

Substances that can cause an allergic reaction, usually absorbed through the skin, nasal passages, lungs or digestive tract.

Irritants

Substances that can cause irritation of the skin, eyes, or respiratory system. Effects may be acute from a single high level exposure, or chronic from repeated low-level exposures.

Triggers

A factor that may bring on or increase the signs and symptoms of asthma.

Untreated or Under-treated Asthma

Untreated or under-treated asthma can be damaging for the person with asthma. Not only can it lead to activity limitation or death, it can lead to airway remodeling. Airway remodeling consists of structural changes that are unlikely to be reversible, resulting from the continued inflammation seen in chronic asthma.

How and Why People Develop Asthma

The cause of asthma is unknown, but it is apparently due to an interaction between genetic and environmental factors. This is the subject of intense current research. The observation that asthma is more prevalent in industrialized countries than in underdeveloped ones has spurred divergent theories. Some people hypothesize that too much modern-day cleanliness encourages inflammatory pathways that lead to asthma as children fail to develop normal immune responses.[3] This theory has been termed the "hygiene hypothesis." Others point to increasing disease in modern society, caused by burning fuels and other pollutants, as well as homes with poor air circulation, indoor pets, and carpeting. Both arguments have merit.

Asthma over the Lifespan

Asthma is often first diagnosed in childhood. Between 50% and 90% of children with asthma develop symptoms (coughing, wheezing, shortness of breath or rapid breathing, and chest tightness) before five years of age.[1] It is sometimes labeled in infants and young children as Reactive Airway Disease. If symptoms persist over the next few years, an asthma diagnosis may follow.

Asthma can develop at any age. When asthma presents in adulthood, it may be a recurrence of recognized or unrecognized childhood asthma that had gone into clinical remission (typically in the early adolescent years). Asthma in persons over the age of 20 appears to be more common and more severe in women. An estimated 15% of adult asthma can be attributed to workplace exposures.[1]

Asthma and Other Chronic Diseases

Asthma is strongly associated with other types of chronic disease. Recently, several studies have reported a correlation between obesity (higher body mass index) and a greater risk of developing asthma in both children and adults. In addition, there is some evidence that weight loss improves lung function, symptoms, morbidity, and health status in obese persons with asthma.[4]

People with asthma may require treatment not only for asthma, but also for associated conditions. For example, people who have been hospitalized for asthma also have an increased risk of subsequent death from chronic obstructive pulmonary disease (COPD) and cardiovascular disease. Research also suggests that these people require as much attention for their other chronic diseases as their asthma.[5]

New-onset asthma in adults with airway obstruction and a history of smoking must be differentiated from chronic obstructive pulmonary disease (COPD). COPD that includes emphysema and chronic bronchitis is airway obstruction due to lung damage primarily associated with smoking. Asthma in adults aged 65 years and older is generally more severe than in younger adults with asthma, based on symptom frequency and severity, medication requirements, hospitalization rates, and mortality rates.

Asthma Triggers in the Environment

The actual cause of the underlying airway inflammation in persons with asthma is often not fully known, although allergens and viral infection may be important in this regard. Once a person has inflamed airways and asthma, multiple factors (triggers) may precipitate or increase asthma symptoms.

1 Centers for Disease Control. (2004). Pathophysiology. In *National Asthma Training Curriculum* [CD-ROM]. Centers for Disease Control.

3 Centers for Disease Control. (2004). Pathophysiology. In *National Asthma Training Curriculum* [CD-ROM]. Centers for Disease Control.

4 Dilley, J., Pizacani, B., Macdonald, S., & Bardin, J. (2005). *The Burden of Asthma in Washington State*. Olympia, WA: Washington State Department of Health.pg:58

5 National Institutes of Health. *National Heart, Lung and Blood Institute*. (1996) NAEPP Working Group *Report: Considerations for Diagnosing and Managing Asthma in the Elderly*. Pg 5

Table 1: Examples of Indoor and Outdoor Asthma Triggers

Agent	Major Sources
Indoor Agents	
Dust mites	Mattresses, bed linens, stuffed fabric toys, feather pillows, carpeting
Animal allergens (dander, saliva, urine)	Cats, dogs, rodents, birds
Cockroaches	Moisture and availability of organic food sources.
Secondhand Smoke	Cigarettes, cigars, other tobacco products
Molds	Excess moisture due to plumbing leaks, roof, walls, window leaks, floods, lack of foundation drainage resulting in damp basements, lack of ventilation
Nitrogen Oxides	Room-vented gas or oil-fired space heaters, gas-fueled cooking stoves and cook tops
Odors Volatile organic compounds	Sprays, deodorizers, pesticides, mold, solvents Pesticides, sealants, adhesives, insulation materials, combustion product, molds
Ozone (O_3)	Laminators and copiers, printers, some air cleaners
Outdoor Irritants	
Ozone (O_3)	Hydrocarbon vapors and nitrogen oxides from combustion (motor vehicles, boats, lawnmowers, power plants) that react in sunlight
Sulfur dioxide (SO_2)	Fossil fuels (power plants), industrial sources; sulfur-containing motor fuels
Fine particulate	Diesel exhaust, gasoline engine exhaust, wood stove and fireplace burning and agricultural burning

Adapted from: Etzel, R. Balk, S., (Eds).(1999). *Handbook of Pediatric Environmental Health*. 1st ed., American Academy of Pediatrics.

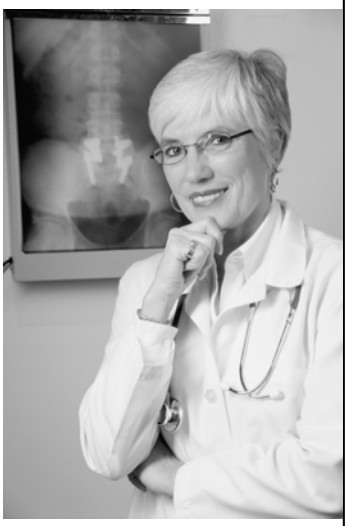
In addition, a number of exposures at work can trigger asthma (see the *Work-Related Asthma* chapter). Some cases of work-related asthma may occur because of a single, high-dose exposure (e.g., ammonia, chlorine gas). Other examples of work-related asthma are associated with longer-term, more continuous exposures (e.g., cedar tree dust).

Exercise as an Asthma Trigger

Asthma can also be triggered by exercise. This condition, called exercise-induced bronchospasm or exercise-induced asthma (EIA), involves narrowing of the airways leading to the lung. It is caused by the loss of heat, water, or both from the airways during exercise that occurs with increased ventilation and inhalation of cool, dry air compared to the air within the lungs.[1] When healthy people exercise, they experience panting and feel out of breath; once exercising has stopped their breathing shortly returns to normal. Persons with EIA experience increased breathlessness once they have stopped exercising, which may not improve until at least 10 minutes after exercising.[1] Parents, teachers, child care providers and others who encourage and monitor exercise in children should be aware of the child's asthma

management/action plan's recommendations on exercise so that they may provide appropriate exercise programs for children with asthma.

Diagnosing Asthma



The diagnosis of asthma is based on the patient's history, physical examination, and objective tests. The history identifies characteristic symptoms as well as a pertinent family history. The history also identifies triggering factors important for that patient. Finally, the history defines the effects of the disease on the patient—unscheduled hospital or clinical care, missed school or work, activity limitations, psychosocial issues, and financial burden.

There are five key indicators for asthma diagnosis that have been identified by the National Asthma Education and Prevention Program (NAEPP) expert panel; however they are not, by themselves, a diagnosis. If multiple indicators are present then it increases the probability that asthma is present. These include:

- History of cough (especially at night), recurrent wheeze, recurrent shortness of breath, difficult, labored breathing, or recurrent chest tightness
- Wheezing, especially in children
- Reversible airflow limitation, happening at varied times during the day, that can be measured by using a peak flow meter
- Symptoms that occur or worsen in the presence of exercise, viral infection, animals with fur or feathers, house-dust mites, mold, smoke, pollen, changes in weather, strong emotional expression, airborne chemicals/dusts, and/or menses
- Symptoms that occur or worsen at night, awakening the person with asthma

Asthma severity can range from mild to severe. Medications) to control asthma are typically prescribed by health care providers based on severity (called classification. Persons with asthma may fluctuate between severity classifications based on exposure to asthma triggers or colds. Patients may move between classifications on a daily basis. For more information on asthma diagnosis, refer to the *Health Care* chapter.

Diagnosis of Work-related Asthma

The diagnosis of work-related asthma should be suspected in all adults with new-onset asthma or recent clinical deterioration. The first step to an appropriate diagnosis is a complete medical history and physical exam. The medical history should include a complete environmental and occupational exposure history. If the exam and history are suggestive of work-related asthma, then the use of objective testing to both diagnose the asthma and attribute it to the workplace should be conducted.

An appropriate and timely diagnosis is critical, as delayed diagnosis and management can often lead to poorer health outcomes. Further, inappropriate diagnosis or management can result in adverse socioeconomic impacts on workers and employers through the loss of productive work. As the diagnosis of work-related asthma is difficult, referral to a specialist is often appropriate and may help to facilitate potentially complex medical, legal, or compensation issues. For information on work-related asthma including known asthmagens in the workplace see the *Work-Related Asthma* Chapter.

The Relationship between Allergies and Asthma

There is a relationship between allergies and asthma; between 70% and 90% of children with asthma have positive allergy skin tests.1 Positive allergy skin tests may or may not correlate with clinical problems.

Determining the relationship between positive allergy skin tests and clinical problems requires family input and evaluation by a health care professional, preferably an allergy specialist. A majority of children with asthma have positive skin test reactions to inhalant allergens such as house-dust mites, cockroaches, animal dander, mold, and pollen. Exposures to these allergens often correlate with increased airway irritability and asthma. This correlation does not hold true for food allergens. While some children with asthma may have food allergy, food does not often trigger asthma unless it is part of a generalized anaphylactic reaction.

In adults with asthma, the prevalence of positive allergy skin tests decreases somewhat with age. However, a recent study has shown that nearly 75% of persons with asthma over age 65 years still had at least one positive allergy skin test. This finding supports the association of asthma with atopy, a tendency to make allergic antibodies after exposure to common environmental agents.[1]

Patients with persistent asthma who are exposed to perennial indoor allergens should be tested for sensitivity to these allergens. Allergy testing can help diagnose allergic factors that contribute to asthma severity and identify approaches and possible candidates for allergy shots (immunotherapy). Testing for indoor molds is problematic because tests are often are limited to those commonly found outdoors and do not contain antigens for common indoor molds. Not all allergy testing has to be conducted by an allergist to interpret and act on skin tests. Also, not all patients may have access to an allergist.

Persons with asthma that is well controlled can lead happy healthy lives. However when a person's asthma is undiagnosed, untreated, undertreated or they live in an unhealthy environment their asthma may interfere with their activities of daily life. The Washington State Asthma Plan has been developed to address prevention, diagnosis and management of asthma in Washington State.

1 Centers for Disease Control. (2004). Pathophysiology. In *National Asthma Training Curriculum* [CD-ROM]. Centers for Disease Control.

Asthma in Washington State

In 2004, the Washington State Department of Health, along with the Data and Surveillance Committee of the Washington Asthma Initiative researched, gathered and analyzed the available asthma and asthma-related data in Washington State. The results of this work were compiled into The Burden of Asthma in Washington State. The Burden Report utilized multiple Washington data sources to describe the overall impact of asthma, populations at risk, the current status of health asthma care, and the environment's impact on asthma.

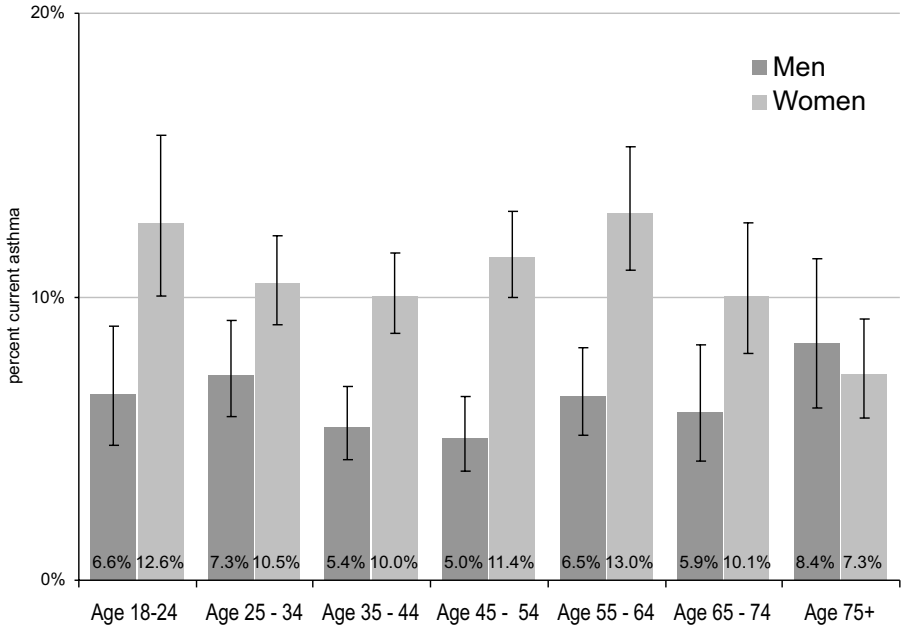
The Burden Report served as the foundation for the Washington State Asthma Plan and much of the data from the report is utilized throughout the state plan. The following section of the plan provides a synopsis of the Burden data. Except where noted, all data reflected here has been taken from the Burden Report.[1]

Washington's Asthma Rates One of Highest in US

In Washington State, an estimated 400,000 Washington adults and 120,000 youth currently have asthma. The CDC has identified Washington's asthma prevalence as among the highest in the nation, and the proportion of the state population with asthma is steadily increasing.

About 1 in 10 women and 1 in 14 men currently have asthma. Between 7% and 10% of middle/high school-aged children have asthma, and 1 in 10 households with children of any age have a child with asthma.

Figure 1: Prevalence of Current Asthma by Age and Gender, Among Washington Adults



Source: 2001-2003 combined Washington State Behavioral Risk Factor Surveillance System (BRFSS)

In Washington State, Asthma is an Important Health Issue

Every year over 5,000 people are hospitalized and about 100 people die as a direct result of asthma in Washington of which more than half the asthma hospitalizations were paid for by Medicare or Medicaid. In total, asthma costs more than $400 million every year in medical expenditures and lost productivity for the state (Figure 2).

1 Dilley, J., Pizacani, B., Macdonald, S., & Bardin, J. (2005). *The Burden of Asthma in Washington State*. Olympia, WA: Washington State Department of Health

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Figure 2: Estimated annual economic costs of asthma, Washington State and US

Annual Costs	US 2002	WA 2002
Direct Medical Expenditures		
Hospital care		
Hosp. Inpt. Care	$2,592,000,000	$68,000,000
ED care	$725,700,000	$19,000,000
Hosp outpt. Care	$960,000,000	$25,200,000
Physician services		
Physician inpatient care	$125,900,000	$3,300,000
Physician office visits	$843,300,000	$22,100,000
Prescriptions	$3,901,900,000	$102,300,000
All direct expenditures	$9,148,800,000	$239,900,000
Indirect costs		
School days lost	$1,321,500,000	$34,700,000
Loss of work/Outside Employment		
Men	$495,300,000	$13,000,000
Women	$1,346,400,000	$35,300,000
Housekeeping	$1,004,500,000	$26,300,000
Mortality	$2,164,700,000	$56,800,000
All indirect costs	$6,332,300,000	$166,100,000
Total Costs		
Direct and Indirect Costs	$15,481,200,000	$406,000,000

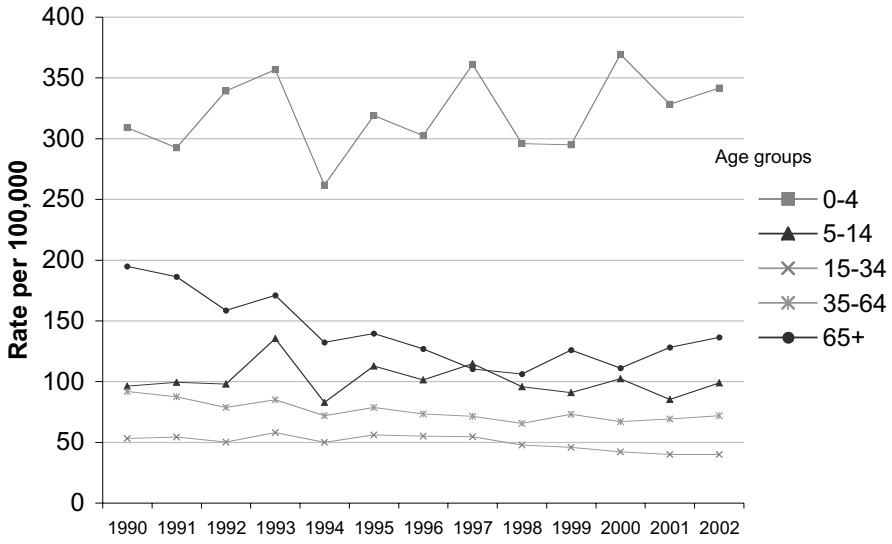
Estimates are synthetic based on published economic literature. Estimated rounded to nearest $100,000.

From1995-2002, more than a thousand claims totaling $12 million were paid by state worker compensation funds for work-related asthma

Asthma Can Reduce a Person's Quality of Life

Uncontrolled, untreated or under-treated asthma may reduce a person's quality of life through limiting their daily activities due to asthma symptoms (e.g., coughing, wheezing, shortness of breath, chest tightness). In Washington, over 75% of the adults and youth with asthma reported they had asthma symptoms during the past month, and half of adults and one-third of youth reported having trouble sleeping because of their symptoms. Each year, about 48,000 adults make at least one emergency department visit. Additionally, adults with asthma make about 100,000 urgent care visits for worsening asthma symptoms. Asthma has also been associated with depression and suicidal thoughts among young people.

Figure 3: Trends for Washington State Asthma Hospitalizations by Age Group



Source: Washington State Comprehensive Hospital Abstract Reporting System (CHARS). Asthma as principal diagnoses.

Youth with asthma miss school because of their condition, and those with more severe asthma symptoms are less likely to have high academic achievement than youth with few asthma symptoms or those without asthma.

Some are Affected More by Asthma

Although asthma affects Americans of all ages, races, and ethnic groups; low-income individuals and communities of color experience disproportionately higher mortality rates, hospital admissions, and emergency department visits due to asthma.

In Washington, children under the age of five and those living in urban, as opposed to rural, areas are the most likely to be hospitalized with asthma. People over the age of 65 are more likely to die from asthma than younger people with asthma. Likewise, Native Americans and African Americans are more likely than non-Hispanic whites to die from the disease.

Some Development of Asthma Cannot Be Controlled

Among young children, boys are more likely than girls to have asthma. By middle school age, asthma prevalence in boys begins to drop and asthma in girls increases, a trend that continues into adulthood. It is hypothesized that this phenomenon is related to boys having smaller airways until adolescence, and increases in estrogen beginning with adolescence impacts girls.

Many people who develop asthma also have allergies, particularly those whose asthma begins in childhood. Additionally, family history of asthma increases the likelihood of developing the disease.

Some Behaviors Can Increase Likelihood of Developing Asthma

In recent studies, asthma has been found to be more likely in persons who have smoked cigarettes or who are obese. Studies have also found that youth with asthma are more likely to smoke and that younger youth (8th graders) with asthma are more likely to use inhaled intoxicants or marijuana than those without asthma. There are also other behaviors such as breastfeeding that may protect against asthma and may reduce the incidence of lower respiratory illness.[2]

2 Oddy WH. (2004). A Review of the Effects of Breastfeeding on Respiratory Infections, Atopy, and Childhood Asthma. *J Asthma*. Sep;41(6):605-21

The Environment Can Cause Asthma or Make Asthma Worse

Environmental exposures play an important role in asthma control. The main factor responsible for causing asthma attacks (exacerbations) and persistent symptoms are exposure to triggers such as allergens, irritants and viral respiratory infections. A substantial number of people with asthma do not realize that they have "triggers" in their homes that make their asthma worse. Dust in carpeting, pet dander, cockroaches, wood smoke, secondhand tobacco smoke, damp environments and mold make asthma worse.

Asthma, especially among children, is caused or worsened by secondhand smoke exposure. One in ten youth lives in a home where smoking is allowed and almost one in ten non-smoking adults with asthma is exposed to smoking at home. Nearly 600 new cases of asthma are caused by exposure to secondhand smoke each year.

Although Washington's air quality is generally good and has improved substantially over time, there are areas of the state where air pollution is of concern, and higher asthma hospitalization rates in urban areas may be related to air pollution exposure. Motor vehicle exhaust (cars, buses, trucks, ships and trains), smoke from woodstoves or outdoor burning, and industrial emissions all affect the quality of outdoor air.

Between 5% and 25% of adult-onset asthma can be attributed to workplace exposures. Occupational exposures vary greatly between occupations and may also include exposure to secondhand tobacco smoke. Smoking is still allowed in some worksites, including worksites where the public can visit and also be exposed, such as restaurants, bars, and casinos.

People with Asthma Need Access to Quality Health Care

People with asthma are more likely than people without asthma to report they had unmet health care needs – times when they wanted to see a doctor but couldn't due to a lack of money. Only about half of adults and youth with asthma reported seeing a health care provider in the past year for a planned preventive asthma visit. Only one-third of youth with asthma reported ever having a written asthma management plan to help them control their asthma with medications and or avoidance of triggers.

Flu and pneumonia vaccines are a recommended component of health care for asthma patients but also for older adults. However, only seven out of every ten adults 65 years of age or older with asthma reported receiving a vaccine. Despite the strong correlation between smoking and asthma, only one in ten smokers with asthma reported receiving advice to quit from a doctor during the past year, another recommended component of health care for asthma patients.

Addressing Asthma: A Comprehensive Approach

One Child's Story…

Jose, age 11, lived in a doublewide trailer provided by his parents' employer, located in the center of grape and hop fields, where he slept on the floor. He had missed 1 1/2 weeks of school over the past 12 months and had been to the emergency department (ED) twice in the past 18 months due to asthma.

Jose's parents had not established a primary care provider for Jose; he was being seen at the local community extended hours clinic for his asthma.

The clinic's asthma program convinced Jose's parents to select a clinic pediatrician to see Jose on a regular basis. It also provided them dust mite covers and a pillow and convinced a local bed manufacturer to provide a free bed.

During the 12 months Jose's family participated in the Yakima Valley Childhood Asthma Project, Jose had no additional visits to the ED, 1 visit to the Extended Hours Clinic and missed only 2 days of school due to asthma.

Addressing Asthma: A Comprehensive Approach

Asthma is a complex chronic disease that deeply affects individuals, families, child/adult and health care providers, the community, work sites, and schools. Addressing asthma effectively requires a public health approach that includes long-term coordinated and multifaceted approaches that are concerned with improving the outcomes in all persons with asthma. This is only accomplished through attention to equity and the most efficient use of resources in ways that enhance patient and community quality of life.[1]

Appropriate and effective public health approaches to asthma use population-based strategies focused on the community rather than on an individual. Instead of focusing on one element of asthma management (e.g., medical care or environmental issues), the plan finds methods or strategies that will provide maximum benefit for the largest number of persons with asthma. This approach does not abandon the needs of individual patients but broadens the reach of the public health systems and the community to include all persons with asthma, especially those who might be designated as underserved.

Public health's mission helping communities to be safer and healthier is an essential service that is guaranteed by law to all residents of Washington State.[2] Certain aspects of this asthma plan deal with serving groups with socioeconomic needs, some deal with equitable treatment by third party payers of the private and public sector, and others deal with non-economic issues such as safety and fair treatment in the schools, and availability of recreational resources for children with asthma. This across-the-board applicability of the public health thrust is very important.

Coordinated Approach to Preventing and Managing Asthma[3]

Studies have shown that individuals need to practice a broad range of health, lifestyle, and self-assessment and treatment behaviors, often with the assistance and support of others to effectively manage their asthma.[4] Improving the understanding and management of asthma as both a personal and public health issue for persons with asthma and their families, policy makers, and the general public in Washington State requires a coordinated effort involving:

- Health Care System
- Environment
- Educational Settings
- Worksites, and
- Community.

1 Illinois Department of Public Health. (2002.) *Addressing Asthma in Illinois: Illinois Asthma State Plan*. Pg: 18

2 Washington State Department of Health. *Public Health in Washington State*. Retrieved: June 21, 2005. http: //www.doh.wa.gov/PHIP/communications/tools/doc/fsph.doc

3 Manchester Harris, AE. (2005) Washington State Department of Health.

4 Center for Disease Control and Prevention. *National Asthma Training Curriculum*. CD-ROM 2004

The goal of this coordinated approach is to assist the person with asthma become self-informed, increase self-management with the result of obtaining a better quality of life.

The community plays an important role in supporting persons with asthma through the actions of asthma coalitions, state health departments, and other community sectors concerned about creating environments that are accommodating to those with asthma. It also supports people with asthma by educating the general public, providers, and politicians on the prevalence of asthma; how to diagnose and treat asthma properly; and why legislation is needed to change the political, social, and physical environment.

This chapter focuses on the coordinated community effort to address asthma. In subsequent chapters, coordination with health care systems, schools, environment, worksites, and policy/advocacy will be addressed.

Coalitions

The interest and assistance of all people, not just health care providers or those affected with asthma and their families, is required to address asthma at both the individual and societal levels.[3] Coordination by a coalition of committed partners across the asthma spectrum - from health care provider to environmentalist - is an essential element of a public health response.[5] Taking advantage of the synergy of teams is an effective way to address the problems and challenges of continuous improvement.[6]

On the national level, federal organizations such as the National Institutes of Health, the Centers for Disease Control and Prevention, and the Environmental Protection Agency are working together to address asthma.[4]

In Washington State, the Washington Asthma Initiative (WAI), a coalition of individuals and organizations concerned about asthma prevention, diagnosis, and management is the key convener for the development of the Washington State Asthma Plan. Since its inception in 1997, WAI has been a leader in forming recommendations and coordinating health care providers from varied backgrounds to work toward improving the prevention, diagnosis and management of asthma in Washington State. WAI serves as the statewide link in communicating issues about asthma among the local asthma coalitions and other state partners. WAI will also provide oversight of the Washington State Asthma Plan, once developed. Each year, WAI will meet to review work from the previous year and to develop a work plan based on the State Asthma Plan priorities, additional surveillance, evaluation and needs assessment data.

Washington State also has several local asthma coalitions that work to address the specific needs of their communities. Currently local asthma coalitions are located in Spokane, Yakima, Snohomish, King, Pierce, and Kitsap counties and in Southwest Washington (Clark County area). These coalitions pursue strategies tailored to address unique community characteristics, such as ethnicity or socioeconomic status and have been shown to be more effective than less well coordinated efforts. The most effective community-based programs share a number of common elements. They employ multiple strategies that utilize behavioral changes, a more interactive educational approach, contain skill-building components and are personalized.[7,8]

Asthma education is the key to recognizing and managing asthma and allergic conditions effectively.[9] Asthma education can help the general public recognize asthma symptoms and encourage persons with asthma to manage their asthma through medical care follow-up and use of appropriate medications. Community awareness may also reduce feelings of stigma among persons with asthma and help to dispel misconceptions.

In 2000, the US Department of Health and Human Services identified top priorities for investment in asthma, recognizing the importance of education to patients, families and the community. They recommended widening the use of current knowledge to diagnose and

5 Center for Disease Control National Center for Environmental Health. *Asthma Speaker's Kit for Health Care Professionals*. Retrieved: April, 2005. http://www.cdc.gov/asthma/speakit/phresponse.htm. Slide 50

6 Richardson T. (1997). *Total Quality Management*. Albany, N.Y.: Delmar Publishers Pg:54

7 Muhlhauser I., Richter B., Kraut D., et al. (1991). Evaluation of a Structured Treatment and Teaching Programme on Asthma. J *Intern Med* 230:157-64

8 Taggart VS., Zuckerman SE., Sly RM., et al. (1991). You Can Control Asthma: Evaluation of an Asthma Education Program for Hospitalized Inner-city Children. *Patient Educ Couns* 17: 35-47

9 American Lung Association of Washington. (1998). *Washington State Asthma Project*. Pg: 41

Asthma-Friendly

An environment that is supportive of persons with asthma which may include policies that:

- provide for access to asthma medications,
- allow modifications in physical activity programs,
- address environmental triggers such as air quality, molds etc.

manage asthma by educating patients and their families and expanding asthma control activities within community settings.[10]

Local asthma coalitions help identify and address needs for prevention and education within communities. One tactic is actively involving community partners/stakeholders in asthma/asthma-related activities (e.g., smoking cessation, agricultural burning). Coalitions also conduct advocacy, fundraising, and program implementation. Some coalitions have been able to secure grant funds to support their activities while others function on membership support only.

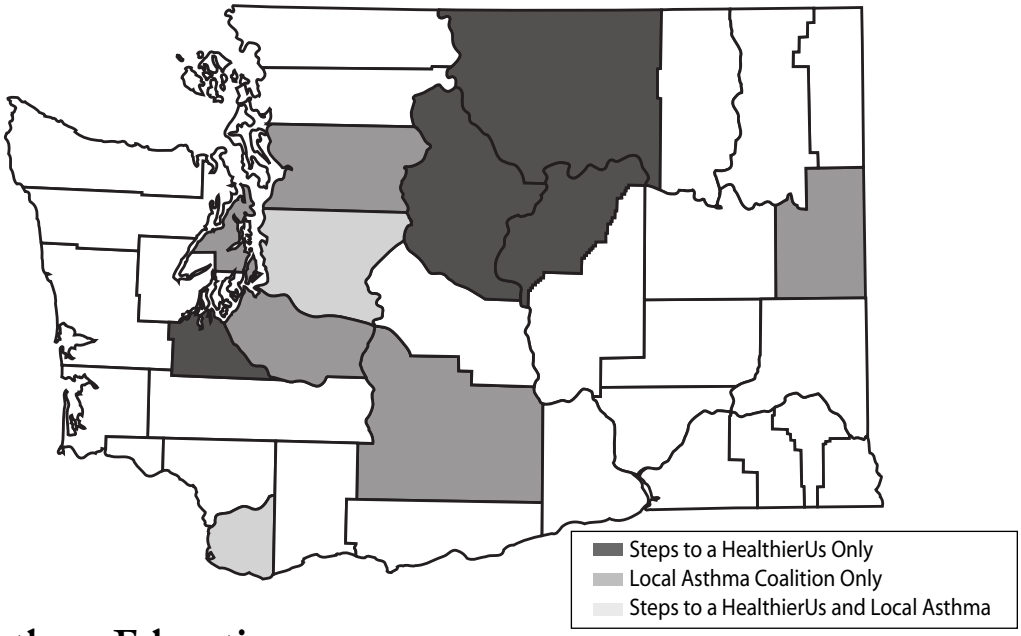
In 2004, Washington State and Public Health Seattle King County both received Steps to a HealthierUS grants from the Centers for Disease Control and Prevention. Steps advocates an integrated approach to the prevention of asthma, diabetes, obesity, and tobacco use and promotes proper nutrition and physical activity. This new approach helps Washington State work as a whole to enhance efforts to reduce chronic disease in communities, schools, worksites and health care settings.

There are four communities funded through the state:

- Chelan, Douglas and Okanogan Counties
- Clark County
- Confederated Tribes of the Colville
- Reservation
- Thurston County

Local Asthma Coalitions & STEPS to a HealthierUS

The Seattle and King County grant target populations in south Seattle and some suburban areas with large underserved populations. The Steps communities are important partners in Washington in that they can assist in implementation of the state asthma plan in their areas.



Asthma Education

Education promotes partnerships among persons with asthma, their families, clinicians, and the community. Increased asthma awareness not only creates a more asthma-friendly environment for them, but also helps develop and maintain important self-regulation skills that help them manage their asthma. Asthma education among those with asthma, provider(s), and the public is an essential component of the public health system for combating this disease[3]

10 US Department of Health and Human Services. (2000). *Action Against Asthma A Strategic Plan for the Department of Health and Human Services*. Pg.34

The results of asthma education activities, as with many health education activities, can be difficult to measure unless there are population-based knowledge surveys being conducted on a periodic basis. In Washington State there is currently no population-based survey mechanism to collect data on knowledge of asthma prevention and management. This does not, however, diminish the importance of providing asthma education.

Child, Youth, and Adult Care Programs

Asthma hospitalization rates for young children (ages 0 to 4) have increased in Washington State.[11] In many areas, community programs that serve children, youth, older adults or persons with disabilities do not have asthma-friendly policies in place. They do not have a uniform mechanism that identifies participants with asthma, provides training for their staff or establishes medication access policies. This causes great risk to participants with asthma. Child care and adult long-term facilities have emerged in recent years as an important area for targeting asthma interventions, as well as a source for participants in the statewide asthma partnership.

Asthma Onset in Adults and Older Adults

Asthma is often associated with childhood. However, more than one in ten Washington adults (13.5%) has been told by a health professional at some point during their lifetime that they have asthma. Nationally, 11% of adults reported that they had ever been told they had asthma at any point in their life.[12]

Adult onset can be related to several factors which might include workplace exposures, smoking or second-hand smoke exposure and/or, for women, hormone replacement. The proportion of adult-onset asthma that can be attributed to workplace exposures has been estimated to be between 5% and 25%; occupational exposures vary considerably for different occupations.[13] Refer to the Work-Related Asthma chapter for further discussion. Adult-onset asthma is more common in women after puberty.[14] It has also been shown that estrogen, when administered to post-menopausal women as hormone replacement therapy, is associated with adult-onset asthma.[15]

The normal aging process and other health issues, such as chronic cardiovascular or lung diseases, may make diagnosis of asthma complicated. Asthma can sometimes be misdiagnosed as chronic obstructive pulmonary disease (COPD).[16] People aged 65 and older have comparatively higher hospitalization rates than middle-aged groups.[17] Access to care and cost of medication are also frequent issues for this population.[3]

Older adults are a target population with specific issues and considerations for asthma interventions. However, asthma programs which specifically address the needs of the older adult population are limited or non-existent in most areas. Unlike school-based asthma programs, there is no central location for programs to access older adults. These factors make education and awareness interventions for the older adult more difficult. Interventions tailored to meet the needs of this population are needed and must be done by partnering with the Department of Social and Health Services Aging and Disability Services Administration, the Area on Agencies on Aging, older adult state homes, elderly community programs and other groups that work with the older adult population.[3]

Current Activities

One of the few programs that specifically address asthma in the older adult population is *Safe Air for Seattle Seniors.* Funded by the EPA and coordinated by the Comprehensive Health Education Foundation (CHEF), *Safe Air for Seattle Seniors* provides outreach and educational programs for older adults with the goal of reducing health risks related to indoor air quality. The project will demonstrate how a targeted educational campaign that is supported by home

11 Dilley J., Pizacani B., Macdonald S., Bardin J. (2005). *The Burden of Asthma in Washington State*. Olympia, WA: Washington State Department of Health. pg: 49

12 Ibid., pg: 27

13 Ibid., pg: iii

14 Ibid., pg: 35

15 Troisi RJ., Speizer FE., Rosner B., Trichopoulos D., Willett WC. (1995). Cigarette Smoking and Incidence of Chronic Bronchitis and Asthma in Women. *Chest* 08:1557-61.

16 National Institutes of Health, National Heart, Lung and Blood Institute. (1996). *NAEPP Working Group Report: Considerations for Diagnosing and Managing Asthma in the Elderly*. Pg: 5

17 Dilley J., Pizacani B., Macdonald S., Bardin J. (2005). *The Burden of Asthma in Washington State*. Olympia, WA: Washington State Department of Health. pg: 85.

assessments can prevent, reduce, and eliminate indoor air pollution. Training for this program is being supported by the American Lung Association of Washington (ALAW) Master Home Environmentalist (MHE) program.

The Yakima Valley Farm Worker Clinic, through its Childhood Asthma Project, provided asthma training to all child care facilities in a 4-clinic area. This project was funded by the Health Resources & Services Administration-Office Of Rural Health Policy and utilized the American Lung Association of Washington's *Little Lungs Breathing*. Local health jurisdiction child care personnel were trained and then arranged provider trainings. Twenty trainings were provided over a three-year period, reaching 304 child care facilities and 547 individuals in the counties of Walla Walla, Benton, Franklin and Yakima. These classes were also offered in Spanish for the first time.[18]

Another child care provider training available in Washington is *Asthma & Allergy Essentials for Child Care Providers*. The Asthma & Allergy Essentials for Child Care Providers training is a one session program developed by a partnership between the Asthma and Allergy Foundation and the EPA to help Head Start, ECEAP, and child care providers recognize symptoms of asthma and allergy. The program improves care of children with asthma and/or severe allergies and increases awareness of the importance of recognizing and mitigating environmental triggers. This class is recognized in Washington State for continuing education credits for providers.

Community health worker models have been implemented in at least three areas in Washington State (Seattle, Tacoma and Yakima). This model utilizes a community outreach worker who works with persons with asthma to provide patient education, training in self-management, the development of a patient-specific asthma action plan, and case management/review. This is coupled with providing in-home environmental assessments to reduce at-home environmental triggers. In King County, a grant from the office of Housing and Urban Development (HUD) also provides supplemental funding to help address poor ventilation, mold-infiltrated surfaces, leaks, holes in walls, carpeting, etc. These models have been found to be effective in decreasing emergency room visits and to better the quality of life for enrollees.[19]

For twenty years the American Lung Association of Washington has offered opportunities for children with asthma to attend summer camps where they receive self-management skills for asthma. In 2005, children will have access to these services in five camps for the entire camping season.

Community Based Activities

Goal 1: Improve the understanding and management of asthma as both a personal and public health issue for persons with asthma and their families, policy makers, and the general public in Washington State.

Objective CBA.1

By 2010, increase the understanding of asthma through asthma awareness and education in Washington State

Strategies

- Develop a media campaign to promote asthma awareness, the need for asthma education and the significance of the impact of asthma in targeted communities who have a higher prevalence of asthma
- Develop mechanisms to educate targeted populations on navigating the health care system (both financially and culturally) for optimal asthma care
- Provide support to camps that have staff specifically trained in asthma management and education
- Support evidence and community-based resources/programs that support people with asthma (such as in-home support programs or community-based classes)

18 Ybarra V., Nagle-McNaughton B. (2004). *Yakima Farm Workers Clinic Childhood Asthma Project Final Report*. Yakima, Washington.

19 Krieger JW., Song L., Takaro T. (2005). The Seattle-King County Healthy Homes Project: A Randomized, Controlled Trial of a Community Health Worker Intervention to Decrease Exposure to Indoor Asthma Triggers Among Low-income Children. *American Journal of Public Health*. 95:652-659.

Objective CBA.2

By 2010, implement over 50% of the prioritized objectives of the Washington State Asthma Plan

Strategies

- Conduct an assessment of the need for local asthma coalitions to conduct asthma activities at the local level
- Support the WAI and local asthma coalitions including the identification of additional funding sources, training and technical assistance
- Structure WAI standing committees to address implementation of the state plan
- Continue to support and expand public and private partnerships to address asthma statewide
- Coordinate with Oregon and Idaho asthma programs, as applicable

Objective CBA.3

By 2008, identify community asthma educational needs for community programs serving children (including child care providers), adults and older adults, their paid and unpaid caregivers and underserved populations within Washington State

Strategies

- Partner with state and local programs working with adults and older adults to conduct a needs assessment to identify their specific asthma education and management needs
- Conduct a needs assessment to identify the prevention needs of community programs serving children (e.g., Child care, Head Start) which includes evaluation of existing educational community-based education programs
- Incorporate needs assessment recommendations into future year's work plans
- Identify and coordinate with stakeholders working with the older adult, community programs, and underserved populations
- Develop specific programs that target groups or characteristics identified or associated with asthma in the Burden of Asthma in Washington State report
- Develop materials and/or educational programs based on the highest needs identified through the needs assessment

Objective CBA.4

By 2010, increase the number of community-based programs serving youth (e.g., youth day camps, summer camps, sport leagues) and older adults which report utilizing asthma management plans and have asthma-friendly policies in place

Strategies

- Develop and/or provide asthma education materials for community-based programs serving youth (such as youth sports)
- Develop and disseminate a model asthma management policy for community youth programs to increase access to asthma rescue medications
- Identify community-based programs' asthma prevention/management
- Incorporate asthma education into the required State Training and Registry System (STARS) and other approved training opportunities for child care providers

- Utilize an effective environmental assessment program to conduct assessments of home and center-based child care centers, long term care facilities, and recreational/community-based centers
- Ensure that Head Start and Early Childhood Education and Assistance Programs (ECEAP) have asthma management policies addressing access to asthma rescue medications

Community Based Activities Workgroup Members

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Health Care

One Woman's Story…

Francis is a 50-year old professional woman diagnosed with asthma in her 40s and has intermittent problems with her asthma.

Insured by her employer, she saw her primary care provider yearly. Most of the time, Francis did not have lot of problems with her asthma.

Still, she ended up at her hospital's emergency room with severe asthma symptoms yearly for three years.

On the third visit to the emergency room, a health care provider gave Francis with an asthma management plan and education on how and when to use her medications. She was also referred to her primary care provider for further follow up.

She had never been given an asthma management plan that described how to monitor her asthma at home and when to take her medications.

As a result of this plan, the education and follow up with her primary care provider, Francis has not returned to the ER for her asthma.

In 2002, asthma hospitalizations cost Washington State $19,000,000.

Exacerbating Factors

Allergens, irritants or other triggers that can cause asthma symptoms to worsen.

Allergens

Substances that can cause an allergic reaction, usually absorbed through the skin, nasal passages, lungs or digestive tract.

Irritants

Substances that can cause irritation of the skin, eyes, or respiratory system. Effects may be acute from a single high level exposure, or chronic from repeated low-level exposure.

Triggers

A factor that may bring on or increase the signs and symptoms of asthma.

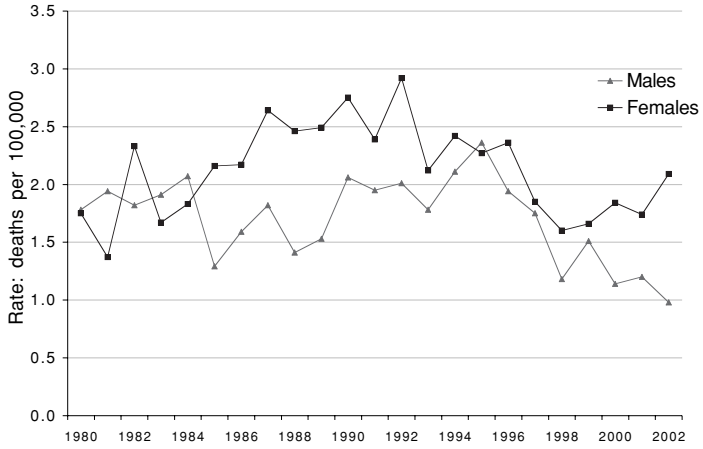
Asthma is a chronic inflammatory disorder of the airways that is associated with obstruction, inflammation or hyper-responsive airways that cause airflow limitation and respiratory symptoms. As with most chronic diseases, diagnosis, treatment and management are critical to controlling the disease. If untreated or under-treated, asthma symptoms can cause limitations to a person's physical health that interfere with his or her quality of life. Physical limitations caused by untreated or under-treated asthma can also result in missed days of work/school or even death.

The role of the health care practitioner is to work with people with asthma (patients) to control their disease and prevent it from interfering with daily life. When an asthma exacerbation (attack) occurs, disease management becomes urgent (acute). Thus, asthma management crosses both the acute and planned models for health services delivery.

In Washington State, an estimated 400,000 Washington adults and 120,000 youth currently have asthma. More than 5,000 people are hospitalized every year, and asthma costs more than $400 million annually in medical expenditures and lost productivity. Preventable asthma-related hospitalizations are expensive to people with asthma and the health care system.[1]

Each year in Washington, nearly 100 people die as a direct result of asthma. Most of these deaths could be prevented. In the last 20 years, Washington State has made little progress in reducing overall death rates for persons with asthma (Figure 3).

Figure 3: Trends for Washington Asthma Deaths by Gender



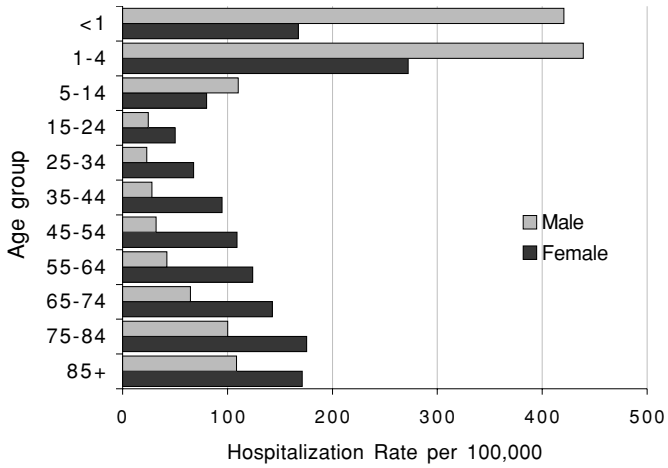
Source: 1980-2002 National Death Certificates, Washington State Death Certificates Asthma as primary cause of death, age-adjusted to 2000 US Population. Dilley, J., Pizacani, B., Macdonald, S., & Bardin, J. (2005). The Burden of Asthma in Washington State. Olympia, WA: Washington State Department of Health.pg:40

Asthma death rates are not the same between men and women in Washington. Although it appears that death rates have been decreasing for men, they are increasing in women, which is consistent with the national trend. Although overall death rates for both men and women have declined since the early 1990s, the decline among women seems to be reversing these past several years.

Asthma-related hospitalizations vary based on age and gender (Figure 4). Younger children (less than five years old) have the most hospitalizations, with boys being more frequently hospitalized than girls. In the teen years, asthma becomes more prevalent in girls and stays elevated through adulthood. New cases of asthma may occur throughout the lifespan, particularly through occupational exposures. Hospitalization rates are low in young adulthood and increase in the older adult.

1 Dilley J., Pizacani B., Macdonald S., Bardin J. (2005). *The Burden of Asthma in Washington State*. Olympia, WA: Washington State Department of Health. Pg: i

Figure 4: Age and Gender-specific Washington State Hospitalization Rates

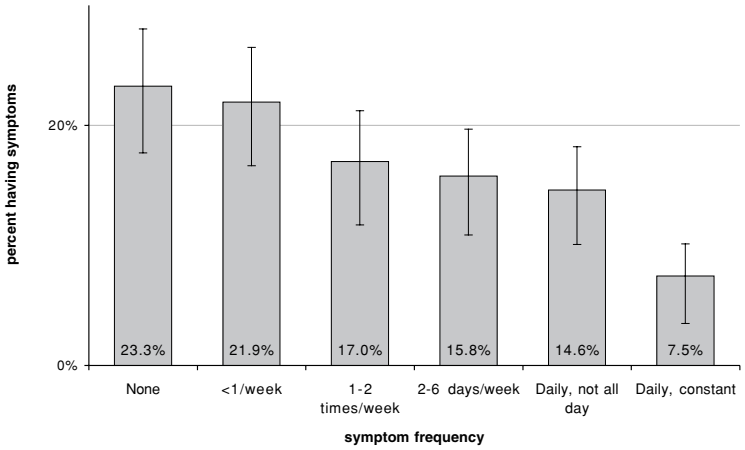


Source: Washington State Comprehensive Hospital Abstract Reporting System (CHARS), 2000-2002 combined. Asthma as principal diagnosis. Dilley, J., Pizacani, B., Macdonald, S., & Bardin, J. (2005). *The Burden of Asthma in Washington State.* Olympia, WA: Washington State Department of Health.pg:38

Symptoms of asthma include coughing, wheezing, shortness of breath, chest tightness and phlegm production when a person does not have a cold or respiratory infection. A person's airways may have a sudden response to being exposed to stimuli (known as exacerbating factors, triggers, irritants, or asthmagens) that can reduce the amount of air flow to and from the lungs.

Frequency of asthma symptoms along with patient history and lung function tests are utilized to diagnose and develop a treatment plan to help the management of asthma.

Figure 5: Distribution of Asthma Symptom Frequency in Past Month, Among Washington Adults with Asthma



Source: 2001 Washington State Behavioral Risk Factor Surveillance System (BRFSS). Persons who stated that they had been told by a physician that they had asthma. Dilley, J., Pizacani, B., Macdonald, S., & Bardin, J. (2005). *The Burden of Asthma in Washington State*. Olympia, WA: Washington State Department of Health .pg. 26.

As shown in Figure 5, only about 23% of Washington adults with asthma reported being free of symptoms during the previous month. More than one in five reported having symptoms at least once every day. The Healthy Youth Survey reported that one in seven youth with asthma experiences symptoms every day. Fewer youth than adults report experiencing daily symptoms, although the difference is small.[2] Uncontrolled asthma symptoms affect the quality of life for persons with asthma and can almost always be avoided with appropriate medical follow up. These data indicate that considerable work is needed to control asthma in Washington State.

2 Dilley J., Pizacani B., Macdonald S., Bardin J. (2005). *The Burden of Asthma in Washington State*. Olympia, WA: Washington State Department of Health. Pg: 14

Treating Asthma

The National Asthma Education and Prevention Program (NAEPP) was first initiated by the National Institute of Health's National Heart, Lung and Blood Institute in March 1989 to address the growing problem of asthma in the United States. Their ultimate goal is to "enhance the quality of life for patients with asthma and decrease asthma-related morbidity and mortality."[3] The NAEPP works with intermediaries, including major medical associations, voluntary health organizations, and community programs, to educate patients, health professionals, and the public. In 1989, the NAEPP developed and distributed the "*Expert Panel Report: Guidelines for the Diagnosis and Management of Asthma.*" These guidelines (updated in 1997 and 2002) were prepared for use by clinicians working in diverse health care settings. They address practical decision-making issues in the diagnosis and management of asthma.[4] These guidelines have become the clinical standards for the care of asthma in the United States.

The NAEPP's Four Components of Asthma Care[5]

- Assessment and Monitoring
- Education for Partnership in Care
- Pharmacotherapy
- Identifying and Controlling Factors Contribting to Asthma Severity

Component 1: Assessment and Monitoring

Asthma is usually diagnosed by a health care professional who has carefully assessed the patient's history and pulmonary function and performed a physical examination. Once the initial diagnosis of asthma has been made, ongoing monitoring is essential.

Key clinical activity areas for the health care provider are to:

- Establish asthma diagnosis
- Establish severity of asthma
- Schedule routine follow-up care, and
- Assess for referral to specialty care.

Asthma care is based on guidelines and guided by disease severity. Significant numbers of people with asthma have not been diagnosed while some people have been under-diagnosed and have uncontrolled asthma.[6] In 2000, a clinical index was developed to define the risk of asthma in young children with recurrent wheezing.[7,8]

Asthma is a manageable disease. Ongoing monitoring of persons with asthma is important to increase positive outcomes for asthma care and to reduce possible hospitalizations. One study showed that, through more appropriate prior care, 74 % of hospital admissions for severe asthma could have been prevented.[9]

The level of severity of asthma has never been shown to be associated with risk of death. Patients with mild, but uncontrolled asthma, have an equal chance of an adverse event occurring as those with severe persistent asthma. In studies conducted on asthma mortality, nearly 90 % of the deaths involved avoidable factors.[10] Studies have shown that, of those who have died from asthma, 78 % had previously been admitted to the hospital at some time in their lives and 40 % had been admitted within the year preceding death.[11,12]

3 National Institutes of Health, National, Heart, Lung, and Blood Institute (1997) *National Asthma Education Prevention Program: Guidelines for the Diagnosis and Management of Asthma*. http://www.nhlbi.nih.gov/about/naepp/naep_pd.htm

4 Ibid., pg: 2

5 Morbidity Mortality Weekly Report. March 28, 2003 / 52(RR06);1-8. http://www.cdc.gov/mmwr/preview/mmwrhtml/rr5206a1.htm

6 National Institutes of Health, National Heart, Lung, and Blood Institute. National Asthma Education and Prevention Program. (1996). *NAEPP Working Group Report: Considerations for Diagnosing and Managing Asthma in the Elderly*. NIH Publication No. 96-3662

7 Castro-Rodriques JA., Holberg CJ., Wright AL., Martinez FD. (2000). A Clinical Index to Define Risk of Asthma in Young Children with Recurrent Wheezing. *AM J Respir Crit Care Med* 162:1403-6

8 Jim Stout: Personal Communications, King County Asthma Forum: Seattle, WA. 2002

9 Blainey D., Lomas D., et al. (1990). The Cost of Acute Asthma – How Much is Preventable? *Health Trends* 22: 151-3

10 British Thoracic Association. (1982). Death from Asthma in Two Regions of England. *British Medical Journal* Clin Res Ed. 285:1251-5

11 Bucknall CE., Slack R., et al. (1999). Scottish Confidential Inquiry into Asthma Deaths.1994-1996. *Thorax* 54:978-84

12 Burr ML., Davies BH., et. al. (1999). A Confidential Inquiry into Asthma Deaths in Wales. *Thorax* 54:985-9

Older Adult Populations

The general approach to managing asthma, including the utilization of the National Asthma Education and Prevention Program (NAEPP) guidelines developed by the National Institutes of Health (NIH), National Heart, Lung, and Blood Institute, is appropriate overall for the older adult population.

The normal aging process and other health issues, such as chronic cardiovascular disease, tuberculosis, or other lung disease may make the diagnosis of asthma complicated. Asthma can also be misdiagnosed as chronic obstructive pulmonary disease (COPD). Up to 40% of patients with asthma also have COPD.[13] This can be especially difficult if the person is a current or former smoker.[14] Furthermore, asthma medications themselves may have unwanted or unpredictable effects on other medical conditions or, similarly, other medical conditions and medications could interfere with asthma medications.[15] Due to the aging process or other health issues, normal lung functioning may be unattainable.[16] Modifications in asthma management may be required to provide the best possible quality of life for the older adult. The NIH provides guidance on distinguishing asthma from COPD and provides a guide for potential adverse effects of non-asthma medications for the older adult patient with asthma.

Component 2: Identifying and Controlling Factors Contributing to Asthma Severity

The key clinical activities in this area for the health care provider are to recommend measures to control asthma triggers and treat or prevent all co-morbid conditions. The majority of people with asthma also react to allergens (e.g., house dust mites, cockroaches, cat and dog dander, and irritants such as secondhand smoke). A person's allergen sensitivity can be determined by exposure/symptom history and confirmed through skin and/or blood testing. The NAEPP recommends allergy testing for perennial indoor allergens in persons with persistent asthma who are taking daily medications. Allergy care coupled with increased utilization of inhaled corticosteroids, has been linked to reductions of emergency hospital care.[17] After sensitivity is determined, avoidance of the trigger is recommended.[18]

Eliminating exposure to potential asthma exacerbating factors through environmental control is complementary to medication management in the control of asthma. Patients can be adherent with their medication but non-adherent in avoidance of their triggers for asthma, which can lead to increased asthma symptoms. Both factors must be attended to for appropriate asthma management.[19] This may include such activities as avoiding cats, using protective bed coverings, and/or staying inside on days with poor air quality.[20]

Other factors that influence asthma are obesity and physical activity. Higher rates of asthma are associated with obesity. It is not clear whether obesity actually exacerbates asthma or if those with asthma are more likely to be obese because of their disease. However, avoidance of exercise increases the risk of obesity. Physical activity triggers asthma attacks in some individuals. This is called exercise-induced asthma.

Efforts to improve the health status of persons with asthma must address the predominant social, cultural, and environmental conditions in which individuals with asthma live.[21] For more information about irritants, including tobacco use and exposure to environmental tobacco smoke, see the *Environmental and Work Related Asthma Chapters*.

Component 3: Pharmacotherapy

For the health care provider, the key clinical activities in this area are prescribing medications according to severity of asthma and monitoring drug use. Medications are administered with the primary goal of preventing asthma attacks.

13 Surveillance Data, Inc. (2004). COPD/*Asthma Diagnoses Overview*: 2001-2003.

14 National Institutes of Health, National Heart, Lung, and Blood Institute. National Asthma Education and Prevention Program. (1996). *NAEPP Working Group Report: Considerations for Diagnosing and Managing Asthma in the Elderly.* NIH Publication No. 96-3662. Pg: 5

15 Ibid. Pg: 14

16 Ibid. Pg: 24

17 Schatz M., Cook EF., Nakahiro R., Petitti D. (2003). Inhaled Corticosteroid and Allergy Care Reduce Emergency Hospital Use for Asthma. J. *Allergy Clin Immunol*. Mar;111

18 Ressel GW. (2003). Practice Guidelines: NAEPP Updates Guidelines for the Diagnosis and Management of Asthma. *American Academy of Family Physicians.* Vol. 68/No. 1 http: //www.aafp.org/afp/20030701/practice.html

19 Tinkleman D. (2005). *CDC Grantee Conference.* National Jewish Hospital: Denver.

20 National Institutes of Health, National Heart, Lung and Blood Institute. (2002). *Key Clinical Activities for Quality Asthma Care: Recommendations of the National Asthma Education and Prevention Program*. Prepared by: Williams SG., Schmidt DK., Redd SC., Storms W.

21 Etzel RA. (1995). *Environ Health Perspect* 103(Suppl 6):55-58. http://ehp.niehs.nih.gov/docs/1995/Suppl-6/etzel-abs.html

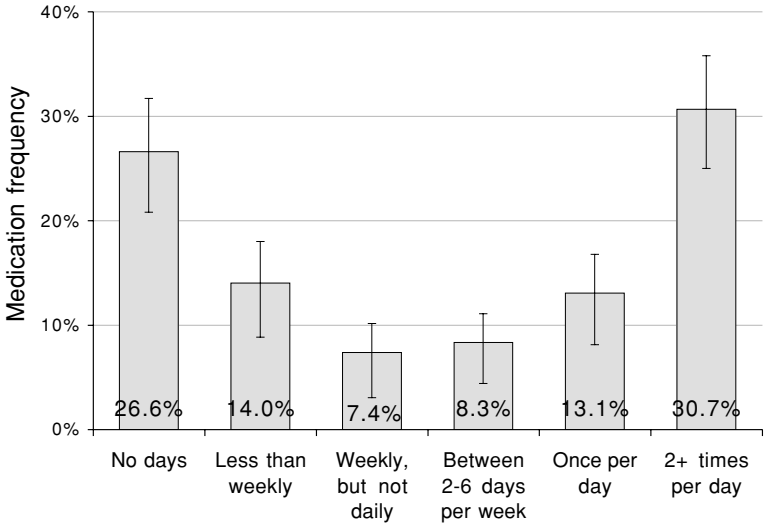
Research on new drugs is occurring and is yielding additional medications. Currently, there are two types of medications for asthma:

Rescue or Reliever Medications
Quick-relief rescue and reliever medications give prompt relief of symptoms of constricted bronchial tubes by relaxing the muscles around the airways and lessening the accompanying acute symptoms: coughing, wheezing, shortness of breath or rapid breathing, and chest tightness.

Long-term Control Medications
These are used daily and help to prevent symptoms from occurring on a long-term basis. These could come in the form of an oral or inhaled medication.

Asthma medications are most effective when patients take them as prescribed. As with many chronic diseases that require daily medications, people may not always take their medications as prescribed. As shown in Figure 6, only about 27% of Washington adults with asthma who were surveyed reported taking no medicine for their asthma - neither control nor rescue medications. About 44% of people with asthma take asthma medication at least once a day, with nearly one-third taking asthma medication two or more times per day. [22]

Figure 6: Distribution of Asthma Medication Use Frequency during Past Month, Among Washington Adults with Asthma



Source: 2001 Washington State Behavioral Risk Factor Surveillance System (BRFSS). [Note: Some people who take asthma medication less often than every month may be counted in the "No days" category.] Dilley, J., Pizacani, B., Macdonald, S., & Bardin, J. (2005). *The Burden of Asthma in Washington State*. Olympia, WA: Washington State Department of Health. pg: 73

Component 4: Education for Partnership in Care

For the health care provider, the key activities in this area are developing a written asthma management plan and providing routine education on patient self-management.

Reduced asthma death rates in both adults and children have been shown when interventions aimed at self-management include:

- A partnership between the patient and the health care provider(s) that includes frequent revision and reinforcement in developing patient self-care goals and,
- The utilization of a written self-management care plan (also called an asthma action plan).[23]

22 Dilley J., Pizacani B., Macdonald S., Bardin J. (2005). *The Burden of Asthma in Washington State*. Olympia, WA: Washington State Department of Health. pg: 72

23 Global Initiative on Asthma, National Institutes of Health, National Heart, Lung and Blood Institute (2002). *Global Strategy for Asthma Management and Prevention*. Pg: 82

Coordination between health care, education, worksite, and community systems to support asthma management is essential. The US Department of Health and Human Services recommends widening the use of current knowledge to diagnose and manage asthma by educating patients and their families and expanding asthma control activities within community settings.[24] The NAEPP guidelines state that, in consultation with the patient (parent/guardian), the health care provider should develop a written plan (also called asthma action or management plans) as part of educating the patient about self-management.

Written asthma action plans help clarify expectations for treatment and provide patients (and their families or other caregivers) with an easy reference for remembering how to manage the asthma. One study reported that 9 out of every 10 caretakers of children with asthma who had an action plan reported the plan to be of value in managing asthma attacks.[25] Asthma action plans have also been accepted and utilized by clinicians and have been shown to result in fewer emergency department visits and hospitalizations for their asthma patients.[26]

The plan should be individualized for each patient and adjusted as needed at every follow-up visit. A copy of the plan should be given to and reviewed by each caregiver and, if applicable, to the school, childcare center, after-school/youth programs, long-term care facility, case manager, and other family members. Refer to the *Asthma in Educational Settings* chapter for more discussion on schools.

Effective patient-provider communication, patient faithfulness to taking medications (adherence), and self-management skills are required for asthma management. Adherence to long-term asthma medication regimes have been estimated at between 50 and 65%.[27] The patients with severity of asthma are at greater risk for non-adherence due to the following reasons: a) difficulty of managing multiple medications to control symptoms, b) coexisting diseases; c) depression and anxiety, and/or d) the high cost of care.[28] Other reasons for non-adherence can include a person's belief systems that are counter to recommended medical practice; poor understanding of the disease and medications; or lack of support, understanding, and appropriate patient education from health care providers.[29]

The NAEPP guidelines have been widely distributed both nationally and within Washington State. In 2003, the Washington State Medical Education and Research Foundation, in conjunction with the American Lung Association and the Washington State Department of Health, published fact sheets on the 2002 NAEPP updated guidelines. These guidelines

24 US Department of Health and Human Services. (2000) *Action Against Asthma A Strategic Plan for the Department of Health and Human Services.* Pg: 34

25 Dinakar C., Van Osdol TJ., Wible K. (2004). How Frequent are Asthma Exacerbations in a Pediatric Primary Care Setting and Do Written Asthma Action Plans Help in their Management?. *J Asthma*. 41(8): 807-12.

26 Ting S. (2004). Multicolored Simplified Asthma Guideline Reminder (MSAGR) for better Adherence to National/Global Asthma Guidelines. *Clin Rev Allergy Immunol*. 27(2):133-45.

27 American Academy of Allergy Asthma and Immunology. (2004). *Achieving Adherence to Asthma Therapy. AAAAI Quality of Care for Asthma Committee Paper*. Prepared by AAAAI Quality of Care for Asthma Committee and Health Care Delivery and Quality (HCDQ) Planning Committee. Milwaukee. WI

28 Weinstein AG. (2005). Should Patients with Persistent Severe Asthma be Monitored for Medication Adherence? *Ann Allergy Asthma Immunol*. 94(2): 251-7.

29 Centers for Disease Control. (2004). *Management. In National Asthma Training Curriculum* [CD-ROM]. Centers for Disease Control.

were distributed in early 2005 to over 3000 family practice and internal medicine physicians in Washington. Nationally, a study conducted of physicians working with children with asthma found that most physicians had substantial understanding of the basic tenets of the NAEPP guidelines including prescribing inhaled corticosteroids; but, opportunities exist in improving written asthma action/management plans and routine follow-up care.[30] In Washington State, it is not known how widely the NAEPP guidelines are utilized in asthma management care.

Asthma as a Chronic Disease

The goal of the health care system in the care of persons with asthma is to provide equal access to high quality care for all. Trained health care providers should be available to provide personal health care. This access to care should be equitable regardless of insurance status. The current system for delivering asthma care is fragmented. To achieve a comprehensive approach to asthma care, statewide implementation of the planned care model, (also known as the chronic care model) is proposed. In order to assess whether the goals related to health care access and quality of care are being met, surveillance systems and evaluation methods are also needed.

The Planned Care Model was developed in the 1990's by Ed Wagner, MD, MPH, Director of the McColl Institute for Health Care Innovation, Group Health Cooperative of Puget Sound, with support from the Robert Wood Johnson Foundation.[31] The model identifies the essential elements of a health care system that are required for high quality chronic disease care. "Evidence-based change concepts under each element, in combination, foster productive interactions between informed patients who take an active part in their care and providers with resources and expertise."[32]

The six elements of the Chronic Care Model (also called the Planned Care Model) are:

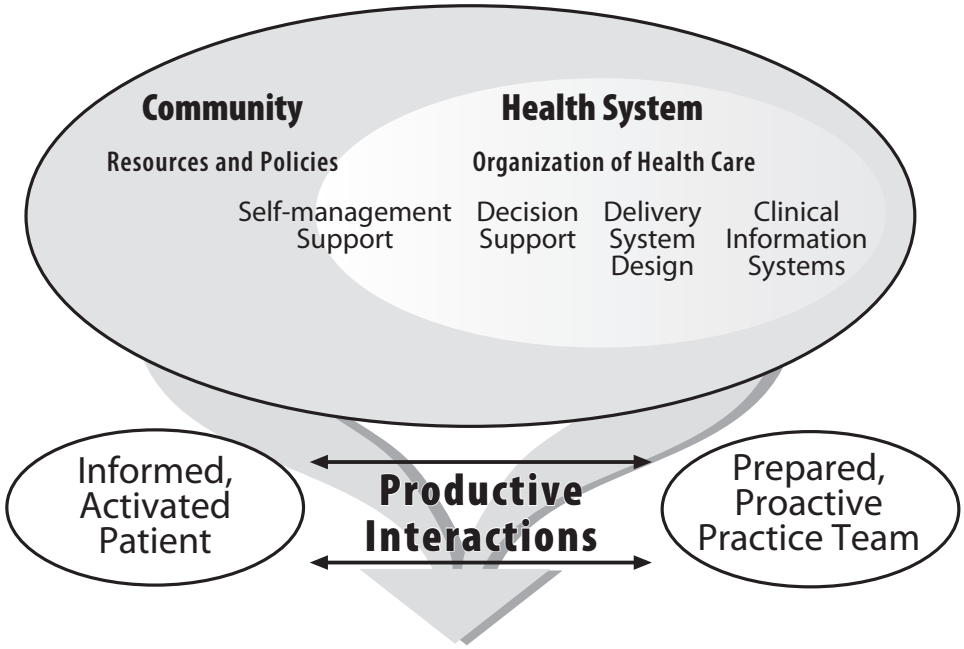
1. Community-Resources and Policies
2. Health System-Organization of Care
3. Self-Management Support
4. Delivery System Design
5. Decision Support
6. Clinical Information Systems

30 Finkelstien JA., Lozano P., Shulrull R., et. al. (2000). Self-Reported Physician Practices for Children with Asthma: Are National Guidelines Followed? *Pediatrics*. 106:4 Supp:886-896

31 Wagner EH. (1998). Chronic Disease Management: What Will it Take to Improve Care for Chronic Illness? *Effective Clinical Practice*. 1:2-4.

32 Ibid.

The Planned Care Model



Source: Wagner EH. (1998). Chronic Disease Management: What Will it Take to Improve Care for Chronic Illness? *Effective Clinical Practice*. 1:2-4 *Reprinted with permission from ACP-ASIM Journals and Books*

The Planned Care Model has been used successfully to improve asthma care, utilizing improvement methods taught in many settings by the Institute for Health Care Improvement.[33] The model has been used extensively to address diabetes care in Washington State, and has been implemented in a few settings for asthma such as community clinics with uninsured patients and migrant farm workers, and with the homeless. This plan recommends much more extensive use of the Model for asthma care and statewide support of registers for electronic patient data collection and clinical information systems (electronic medical records).

Asthma care depends on a variety of health providers who have contact with the patient. These providers may include the emergency department (ED) physician, nurse practitioner, physician assistant, family physician, pediatrician, registered medical assistant, nurse, respiratory therapist, community health worker, and/or pharmacist. Each needs to be able to communicate a clear message to the patient and reinforce the steps need to take to manage their disease. The existing health care system is fragmented and does not support the provision of comprehensive integrated care to persons with asthma. Medical providers lack adequate access to data that would allow for rapid system improvement in delivery of care in the clinic or office setting. Families often move around the state and see different providers who have different approaches to managing the disease.

Ideally, in a health care system built on the planned care model, community resources are integrated with those of the clinic/office to provide comprehensive care. An example might be community-sponsored nutrition classes that teach healthy eating patterns for persons with diabetes. The entire health system is organized to provide comprehensive care.

33 Wagner EH. (1998). Chronic Disease Management: What Will it Take to Improve Care for Chronic Illness? *Effective Clinical Practice*. 1:2-4.

Complementary and Alternative Medicine

A group of diverse medical and health care systems, practices, and products that are not presently considered to be part of conventional medicine.

Asthma Health Tracking

Washington State currently lacks a statewide system for tracking health care-related data on asthma for patients who are treated in clinic (out-patient) or emergency department settings. No defined core measures for tracking asthma outcomes or methods for collecting such data exist in the state. At the provider level, a lack of registries and integrated electronic medical record systems deter tracking of the clinical status of patients with asthma and monitoring adherence to guidelines for asthma care on an ongoing basis.

In addition, there is no statewide system to coordinate data so that all members of the care team know what is happening with patients in a timely manner. For example, primary care practitioners are not universally and promptly notified that one of their patients has been seen in the emergency department. Since continuity of care is important for asthma, closing of this data gap is important.

Provider Education

All health care practitioners need to maintain current skills in the management of asthma. Changing physician practice behavior in the care of asthma patients may require multiple approaches. Didactic lectures often achieve some change, but interactive system-based or problem-solving approaches have shown promising effects with equal or enhanced positive changes in asthma outcomes in some studies.[34] Non–traditional forms of education through the planned care collaborative model, long distance learning (e.g. Telemedicine or Telehealth) and feedback on patient status via data collection systems and electronic medical record data are other promising strategies for provider training. Long distance learning technology has the potential to help fill in some of the anticipated gaps for making specialist care accessible in rural areas.

Complementary and Alternative Medicine

The World Health Organization estimates that four billion people use complementary and alternative medicine (CAM) and that as much as 80% of the world's heath care is CAM-based.[35] In some countries, CAM has been used by the public health systems as a remunerated and accepted alternative to standard care. In 1998, the Institutes of Health established a National Center for Complementary and Alternative Medicine (NCCAM) to explore CAM healing practices in the context of rigorous science, provide training for CAM researchers and to disseminate authoritative information to the public and professionals.

The utilization of complementary and alternative medicine (CAM) among patients with asthma is very popular and estimated use is from 41% to 59%.[36] It is unknown how many patients in Washington State utilize CAM, alone or in combination with traditional medicine, as there is no data source to collect this information. Providers may not think to ask patients about their use of CAM, or about over-the-counter drugs taken to help relieve their asthma symptoms.

Access to Health Care

Access is referred to in three contexts: the first is access to trained health care providers; second is geographic access to care throughout the state; and third is equal access to care regardless of personal resources (such as insurance status).

Asthma is a complex disease and most patients receive their primary care through one provider, however, there are circumstances when a referral to a specialist (e.g., allergist) is indicated.[37] All persons with asthma should have equal access to care, including specialists.

Lack of access to health insurance, knowledge of insurance coverage, and/or high co-payments can prevent a person from receiving optimal asthma care. At this time, current statistical information about access to asthma care is not available.

34 Lozano P., Finkelstein JA., Carevy VJ., Wagner EH., et al. (2004) A Multisite Randomized Trial of the Effects of Physician Education and Organizational Change in ChronicAsthma Care: Health Outcomes of Pediatric Asthma Care Patient Outcome Research Team II Study. *Arch Pediatr Adolesc Med.* Sep;158(9): 875-83

35 George, M. (2005). *Complementary and Alternative Medicine* (CAM) and Folk Care in Asthma: *Assessment, Education and Integration.* CDC Teleconference.

36 Brutsche MH. (2002). Complementary and Alternative Medicine in Asthma – Safety, Effectiveness and Costs. *Swiss Med Wkly*.132:329–331.

37 National Institutes of Health, National Heart, Lung and Blood Institute. (2002). *Key Clinical Activities for Quality Asthma Care: Recommendations of the National Asthma Education and Prevention Program*. Prepared by: Williams, S.G., Schmidt, D.K., Redd SC., Storms. W.

Policy Issues

Strategies to address asthma must tackle an array of issues. Leadership is needed at the local, state and national levels. Several of the issues that are faced by persons with asthma are rooted in the health care system as a whole, such as access to medical care and insurance coverage for chronic disease education and management. Below are some health system policy issues that are critical to addressing asthma in Washington State.

- People with asthma should have access to care by health care practitioners and specialists with appropriate expertise in treating asthma throughout Washington State - rural and urban, regardless of insurance status, racial/ethnic background or place of residence.
- National and state evidence-based asthma management guidelines should be used throughout health care organizations and practices as the standard of care.
- Utilization of the Planned Care Model for systems change and promotion of integrated comprehensive electronic medical records and registries should be employed to track patient clinical status and outcomes.
- A system that rewards health care practitioners and health care delivery systems for providing high quality care that follows national and state guidelines needs to be established.

Current Activities

The Washington Asthma Initiative Practitioner's Support Committee, recognizing the need for specialized training in asthma care, developed the Asthma Educator Institute (AEI). The objective of WAI in developing this training was to raise statewide standards for asthma education. AEI is an advanced course for licensed health care providers and other health professionals engaged in asthma education.

In response to a 2001 legislative directive regarding disease management, the Medical Assistance Administration contracted with the McKesson Company to provide intensive case management and coordination of activities for the Department of Social and Health Services clients who have asthma. An evaluation study conducted by the University of Washington found that patients in a disease management program were twice as likely to have written care plans.[38]

In 2002, with funding from the Robert Wood Johnson Foundation, the King County Asthma Forum and Allies Against Asthma developed a clinical quality improvement (QI) intervention, using elements of the planned care and learning collaborative models. Four clinics are participating in the intervention. Each clinic has: a) established a quality improvement team; b) received asthma-specific training; and c) is utilizing an asthma database to track client data (registry). In 2004, approximately 1300 asthma patients have been entered into the registry. One clinic calculated a 42% reduction in hospitalizations, a 66% reduction in ED visits, and a 13% reduction in acute visits among its patients with asthma.[39]

In 2004, the WAI Practitioner's Support Committee Quality Improvement Workgroup developed and distributed an easy-to-use version of NAEPP clinical guidelines to 3,000 practitioners statewide.

38 Christakis D., Connell F., Richardson A., Maciejewski M,. (2004). *Report of Disease Management Evaluation*. University of Washington. http: //fortress.wa.gov/dshs/maa/newsdoc/DMEvalDocs.pdf

39 King County Asthma Forum, Public Health – Seattle and King County. *Learning Collaborative Intervention.* December 2004.

Health Care Goals

Goal 1: All persons with asthma will have access to quality asthma care in Washington State.

Objective HC1.1

By 2010, Washington State will utilize public health and medical care approaches to reducing the burden of asthma through increased access to health care service delivery statewide

Strategies

- Collaborate with specialty organizations to determine what data exists about availability of services and barriers to access (such as transportation) and then conduct surveys if necessary
- Establish a baseline assessment of primary and specialty care services available to individuals with asthma

Objective HC1.2

By 2010, assure that people with asthma in all areas of the state receive quality asthma care from health care practitioners with current expertise in managing asthma

Strategies

- Incorporate creative programs into community-level professional education opportunities such as distance learning
- Train additional specialists in asthma care (such as allergists, pulmonologists) if statewide assessment indicates this is a need
- Provide access to training on asthma management for health care professionals and relevant service providers in the long-term care system (e.g., nurses providing Nursing Services and Delegation, adult day services staff)
- Enhance the asthma management training component in the family practice residency and other health care professional training programs, particularly through the use of the Planned Care Model quality improvement collaborative methodology
- Maintain support of the Asthma Educator Institute and increase the number of people certified in Washington State
- Develop a proposed system for distance learning for health care professionals to develop and maintain current skills in asthma management and to share expertise with others

Goal 2: Promote optimal patient care of all persons with asthma through seamless and timely tracking asthma care service utilization statewide.

Objective HC2.1

By 2010, a comprehensive surveillance and monitoring system will be in place in order to assess asthma care in Washington State

Strategies

- Establish a baseline assessment of primary and specialty care services available to people with asthma in Washington State
- Develop a partnership with health plans and other data sources to monitor clinical asthma care statewide
- Complete a pilot project in at least one ED where primary care practitioners are notified promptly about patients that have been seen for an asthma attack

Goal 3: Health care practitioners and health care delivery systems will provide high quality care that follows national and state guidelines.

Objective HC3.1

By 2010, at least 80% of health care practitioners will deliver asthma care that follows national and state guidelines

Strategies

- Develop systems to ensure that all people with asthma have written self-management goals
- Monitor health plan and patient registry data system to ascertain that all asthma patients are receiving the recommended medications in accordance with national guidelines
- Support systems that enhance the planned care approach and other improvements in the clinical service delivery system
- Support policies/procedures that all persons with asthma have a written, dated asthma action plan
- Identify standardized resource tools that meet best practices criteria for patient education and counseling and make these available statewide
- Implement alternative approaches for implementing the Institute for Health Care Improvement collaborative model in Steps to a HealthierUS communities and others

Goal 4: Continuously monitor changes in the field of asthma care and incorporate as appropriate.

Objective HC4.1

By 2006, develop a statewide communication system for new information and research about asthma care

Strategies

- Form a work group to develop and implement a plan to keep health care stakeholders informed of professional education opportunities via the worldwide web
- Form a work group to develop a systematic method of disseminating information on new clinical research citations and abstracts on a regular basis

Objective HC4.2

By 2010, explore the role of complementary and alternative medicine (CAM) in asthma care on an ongoing basis

Strategies

- Promote collaborative workgroup meetings for people interested in asthma to build bridges between different groups, including CAM and Western medicine.

Health Care Work Group Members

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Karen E. Krueger, RN, MN, MBA	WA State Dept of Health, Public Health Nurse Consultant

Member — Affiliation(s)

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Asthma and the Environment

A Story of Children and Indoor Air…

In 2003, the Snohomish Health District's Partners in Child Care received a grant from the Environmental Protection Agency (EPA) to reduce health affects (including asthma) caused by poor air quality in child care.

They conducted environmental assessments at 44 child care facilities (humidity, temperature, carbon monoxide, carbon dioxide, and particulate matter testing). They also interviewed each childcare provider, provided them with information on the testing results, and gave them educational materials and supplies.

The most common recommendations were: reduce chemical use; monitor and reduce moisture in the air, increase fresh air exchange by opening windows; review the educational materials provided; and develop care plans for children with respiratory health problems.

A six month follow up was conducted at each of the sites and found that many of the facilities had made changes which resulted in better air quality. Some providers opened the windows more often resulting in a drop in carbon dioxide levels and relative humidity. Of the home child care providers, 92% stated they now use fewer chemicals for cleaning and almost all said they would continue to use the less toxic alternatives provided.

Improving environments for children with asthma can be done inexpensively when child care providers receive education that builds their knowledge and skills.

Asthma and the Environment

Environmental exposures play an important role in the development and management of asthma. The main factors responsible for triggering asthma attacks (exacerbations) and persistent symptoms are exposure to allergens, irritants and viral respiratory infections Some allergens (substances that can cause an allergic reaction) are common biological agents such as animal dander, dust mites, cockroaches, and molds. Other common respiratory irritants include diesel exhaust, fumes from household and industrial cleaning products, solvents, new building and finishing materials, secondhand smoke and air pollution, including ozone and fine particles.

Environmental pollutants contribution to the incidence, prevalence, mortality, and costs of pediatric asthma in American children is estimated at $2 billion.[1] Annual expenditures for health and lost productivity due to asthma were $14 billion in 2002.[2] The estimated cost of treating asthma in those under 18 is $3.2 billion per year.[3]

Indirect costs as a result of asthma, such as school days lost, decreased performance in school, loss of work, housekeeping, and mortality, have annual costs of about $6 billion in the US and $166 million in Washington. Nationally the estimated 10 million school days children miss each year alone result in $1 billion in lost productivity as parents miss work to care for their children. This does not include the cost of lost productivity from adults with asthma who miss work.[4] See *The Burden of Asthma in Washington State* for more information on economic costs.

The disabilities and risk of death associated with asthma are largely preventable with proper medical attention and reductions in environmental triggers.[5] Parents, community leaders and organizations from the public, private and non-profit sectors can play important roles in reducing asthma triggers (allergens or irritants) where people live, learn, work and play. Supportive environments for people with asthma are environments enhanced for all people.

Exposures to allergens or irritants can occur in both indoor and outdoor settings. In Washington State, exposure to allergenic or irritant agents is relatively common due to geographical concentrations of air pollutants, proximity to industrial emissions and individual behaviors. Western Washington has a damp climate where mold can easily grow. Faulty building construction, "deferred maintenance", and/or poor fresh air ventilation lead to frequent complaints about indoor mold problems. Extensive trucking and marine vessel transport occurs in this region contributing to diesel exhaust concerns.

In Eastern Washington, agricultural burning is a common practice and forest fires can also occur anywhere in the state when drought conditions exist. Even with a dryer climate, mold related issues also occur in Eastern Washington due to water intrusion or ventilation problems. Throughout Washington, many residents use wood stoves or fireplaces to heat their homes. Volcanic activity is an additional episodic source of air pollution.

Allergens
Substances that can cause an allergic reaction, usually absorbed through the skin, nasal passages, lungs or digestive tract.

Irritants
Substances that can cause irritation of the skin, eyes, or respiratory system. Effects may be acute from a single high level exposure, or chronic from repeated low-level exposures.

Triggers
A factor that may bring on or increase the signs and symptoms of asthma.

1 Landrigan PJ., Schechter CB., et al. (2002). Environmental Pollutants and Disease in American Children: Estimates of Morbidity, Mortality, and Costs for Lead Poisoning, Asthma, Cancer, and Developmental Disabilities. *Environmental Health Perspectives*. Volume 110, No. 7.

2 National Heart, Lung and Blood Institute. (2002) *Morbidity & Mortality: 2002 Chart Book on Cardiovascular, Lung and Blood Diseases.* P: 17.

3 Weiss KB., Sullivan SD., Lytle CS. (2002). Trends in the cost for asthma in the United States, 1985-1999. *Journal of Allergy & Clinical Immunology*. 106: 493-499

4 U.S. Department of Health and Human Services. (2000). *Healthy People 2010: Understanding and Improving Health*. 2nd ed. Washington, DC: U.S. Government Printing Office.

5 Peters JM., Avol E., Berhane K., Gauderman WJ., Gilliland F., et al. (2004). *Epidemiologic Investigation to Identify Chronic Effects of Ambient Air Pollutants in Southern California. California Air Resources Board*.

Table 1: Common Indoor and Outdoor Agents Precipitating Asthma

Agent	Major Sources
Indoor Agents	
Dust mites	Mattresses, bed linens, stuffed fabric toys, feather pillows, carpeting
Animal allergens (dander, saliva, urine)	Cats, dogs, rodents, birds
Cockroaches	Moisture and availability of organic food sources.
Secondhand Smoke	Cigarettes, cigars, other tobacco products
Molds	Excess moisture due to plumbing leaks, roof, walls, window leaks, floods, lack of foundation drainage resulting in damp basements, lack of ventilation
Nitrogen Oxides	Room-vented gas or oil-fired space heaters, gas-fueled cooking stoves and cook tops
Odors Volatile organic compounds	Sprays, deodorizers, pesticides, mold, solvents Pesticides, sealants, adhesives, insulation materials, combustion product, molds
Ozone (O_3)	Laminators and copiers, printers, some air cleaners
Outdoor Irritants	
Ozone (O_3)	Hydrocarbon vapors and nitrogen oxides from combustion (motor vehicles, boats, lawnmowers, power plants) that react in sunlight
Sulfur dioxide (SO_2)	Fossil fuels (power plants), industrial sources; sulfur-containing motor fuels
Fine particulate	Diesel exhaust, gasoline engine exhaust, wood stove and fireplace burning and agricultural burning

Adapted from: Etzel, R. Balk, S., (Eds).(1999). *Handbook of Pediatric Environmental Health*. 1st ed., American Academy of Pediatrics.

Outdoor Air Quality

Poor air quality in many U.S. cities results from a variety of common activities such as driving cars and trucks, burning wood, coal, oil and other fossil fuels, and degreasing and painting operations. Volcanic ash, smoke from forest fires and agricultural burning also contribute to air pollution. Poor outdoor air quality that contains easily inhaled small particles and ozone can cause or worsen lung-related diseases, including emphysema, chronic bronchitis and asthma.[6] Approximately 25 percent of children in the United States live in areas that exceed the Federal Government's standard for ozone.[7] Washington State currently has four areas in maintenance status for ozone.

Despite improvements brought by tighter regulation of air pollution, increasingly widespread diesel engine use and increases in number of vehicle miles driven now represent a significant percentage of fine particle concentrations in Washington State. Generation of microscopic particles that penetrate deep into human lungs and enter the circulatory system represent a threat to respiratory and cardiac health. These particles contain chemicals that

Particulate Matter (PM)

Particulate matter is the general term used for a mixture of solid particles and liquid droplets suspended in the air. It includes aerosols, smoke, fumes, dust, ash, endotoxin, mold products, and pollen.

Ozone (O_3)

Naturally formed gases that are beneficial in the layer of atmosphere but when close to the ground can irritate the respiratory tract, cause chest pain or persistent cough, affect the ability to inhale deeply, and increase susceptibility to lung infection.

Air Quality Index (AQI)

Submitted daily by the EPA, this reports on how clean the air is by measuring ground level ozone, particle matter, carbon monoxide, sulfur dioxide and nitrogen dioxide.

6 Busse WW., Gern JE., Dick EC. (1997). The Role of Respiratory Viruses in Asthma. *Ciba Foundation Symposium* 206: 208-213.

7 Office of Air Quality Planning and Standards, U.S. Environmental Protection Agency (EPA). (1997). *National Air Quality and Emissions Report, 1997*. CPA Pub. No. EPA 454/R-98-016. Research Triangle Park, NC: EPA, 1998.

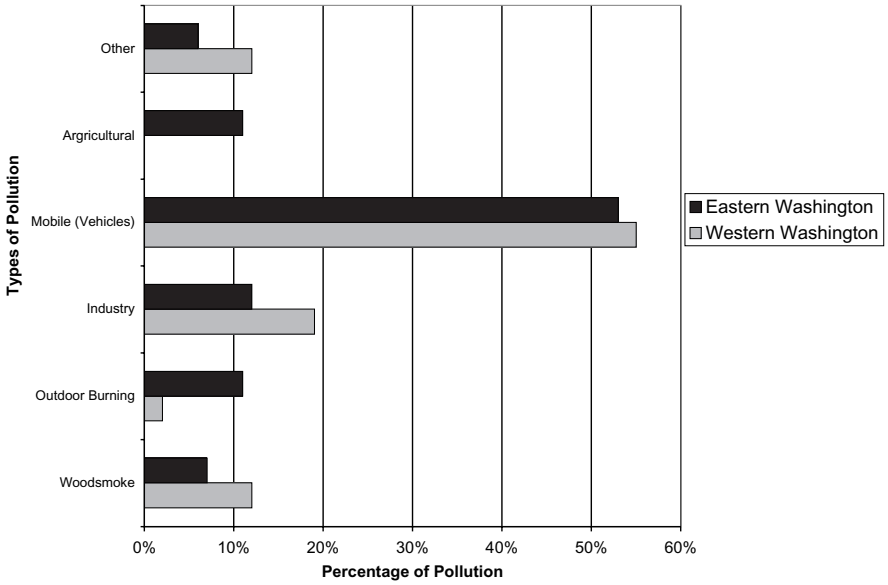
cause oxidative stress in human cells, a process that leads to cell damage and an inflammatory response from the immune system.[8,9,10] Such inflammation appears to be an important step leading to respiratory problems such as allergic rhinitis, sinusitis and asthma.

Diesel Particles:

- Are themselves allergenic
- Worsen allergic responses to allergens such as pollens
- Create asthma symptoms in people affected by these conditions which can cause damage to the lungs
- May increase the risk of developing allergies or asthma at initial exposure.[11]

Washington's outdoor air quality is generally considered moderate to good, and its air quality has improved over the last ten years. However, the state's growing population and continued reliance on private motor vehicles threatens air quality. The main sources of air pollution in Washington are, respectively, motor vehicles, wood stoves and fireplaces, and outdoor burning. Other sources include lawnmowers, recreational motorboats and recreational vehicles, aircraft, trains and ships.

Figure 2: Air Pollution in Washington and Eastern Washington, by Pollutions, 2002



Washington State Department of Ecology.

The primary cause of poor air quality in Washington is motor vehicle exhaust containing many pollutants. In addition, motor vehicles are major contributors to ground-level ozone. Particulate matter (PM) is perhaps the most significant health concern related to poor air quality.[13] Particulate matter is composed of both coarse and fine materials. Of greatest concern is the particulate matter of less than 2.5 microns (PM2.5) in size that can travel deep into the respiratory system (a micron is defined as a one millionth of a meter in length). Outdoor burning and agriculture burning/practices have a somewhat greater impact on air quality in Eastern Washington than in Western Washington while industry and woodstove emissions have a somewhat greater impact in Western Washington than in Eastern Washington.[14]

A recent case-control study nested within a large population-based cohort study of California children from twelve communities indicates that environmental exposures before age five are risk factors for the early-onset persistent asthma.[15] Exposures include wood or oil smoke, soot or exhaust, pesticides and farm crops, farm dust, or farm animals. New onset of asthma has also

8 Fahy O., Hammad H., Sénéchal S., Pestel J., et al. (2000). Synergistic Effect of Diesel Organic Extracts and Allergen Der p 1 on the Release of Chemokines by Peripheral Blood Mononuclear Cells from Allergic Subjects. *Am J Respir Cell Mol Biol* 23: 247-254.

9 Fujieda S., Diaz-Sanchez D., Saxon A. (1998). Combined Nasal Challenge with Diesel Exhaust Particles and Allergen Induces *in vivo* IgE Isotype Switching. *Am J Respir Cell Mol Biol* 19: 507-512.

10 Pandya RJ., Solomon G., Kinner A., Balmes JR. (2002). Diesel Exhaust and Asthma: Hypotheses and Molecular Mechanisms of Action. *Environmental Health Perspectives* 110(sup 1): 103-112.

11 Riedl M., Diaz-Sanchez D., (2005). Biology of Diesel Exhaust Effects on Respiratory Function. *Journal of Allergy and Clinical Immunology.* February; 115(2):221-8; quiz.

12 Washington State Department of Ecology. (2001). *Air Lines, Let's Keep it Clean.* May. http: //www.ecy.wa.gov/pubs/ 0102002.pdf

13 Dilley J., Pizacani B., Macdonald S., Bardin J. (2005). *The Burden of Asthma in Washington State*. Olympia, WA: Washington State Department of Health. Pg: 94

14 Dilley J., Pizacani B., Macdonald S., Bardin J. (2005). *The Burden of Asthma in Washington State*. Olympia, WA: Washington State Department of Health. Pg: 88

15 Salam MT., Li Y-F., Langholz B., Gilliland FD. (2004). Early-life Environmental Risk Factors for Asthma: Findings from the Children's Health Study. Environmental Health Perspective. 112(6): 760-765

been associated with heavy exercise of children living in communities with high concentrations of ozone.[16] Development of chronic bronchitis in Southern California children with asthma was noted to be related to levels of PM10 and PM2.5, acid aerosols and nitrogen dioxide.[17]

Despite progress in achieving clean outdoor air in Washington, specific geographic areas remain at continued risk for poor air quality. For people with severe asthma it may be important to monitor air quality routinely. The air quality index is a good source for information on fine particulate matter and ground level ozone levels. The air quality index is maintained by the Department of Ecology and regional air quality agencies.

Home Indoor Air Quality

Homes contain a wide variety of environmental allergy and asthma triggers. Information about environmental asthma triggers and effective control strategies is necessary to empower residents to reduce exposures in the home. Exposure to environmental allergens or irritants (such as dust mites) has been identified as being linked to the development of asthma and to worsening asthma symptoms.[18] One study showed that exposure to cockroach antigen in the first year of life is also a risk factor for the development of asthma early in life.[19] Two recent studies found suggestive and limited evidence for association between damp indoor spaces and the development of asthma.[20] The second study, a recent six-year population-based cohort study of home dampness and mold concluded that exposure to molds increases the risk of developing asthma in children.[21] (See Table 1 for examples of common asthma triggers.)

Dust Mites

A microscopic, often translucent arachnid that lives on skin scales in bedding, carpeting, and stuffed toys. When fragments of its feces are inhaled they can produce an allergic reaction leading to inflammation in the lung.

A Seattle study of homes of low-income children found that environmental triggers played an important role for children with asthma, particularly in those sensitized to allergens or irritants commonly found in the home environment. The researchers suggested that clinicians need to enlist the aid of parents in the management of their children's asthma. This study demonstrated that using a global approach to environmental interventions in the homes of low-income children with asthma can be easily taught and understood by families. These interventions can change behaviors related to asthma triggers, reduce many of the exposures, and improve asthma and caregiver quality of life.[22]

Secondhand Smoke

Secondhand smoke is a well-documented, potent trigger for asthma. *The Burden of Asthma in Washington State* report found that even though there is conflicting evidence as to whether active smoking is a risk factor for developing asthma, researchers agree that smokers with asthma have more severe symptoms than people with asthma who do not smoke.

In Washington, current smokers (people who smoke every day or just on some days, combined) had the highest prevalence of asthma, former smokers somewhat less, and never-smokers had the lowest prevalence of current asthma.[23] Among Washington middle school-aged youth current smoking is strongly associated with asthma, but the association is not significant for high school-aged youth.[24]

Exposure to secondhand smoke worsens asthma in a number of ways. In a variety of studies, exposed children with asthma had a more frequent need for emergency services, a greater need for medications, and a more difficult time recovering from an acute asthmatic episode.[25]

16 McConnell R., Berhane K., Gilliland F., London SJ., et al. (2002). Asthma in Exercising Children Exposed to Ozone: A Cohort Study. Lancet. Feb 2;359 (9304);386-391.

17 McConnell R., Berhane K., Gilliland F., London S., et al. (1999). Air Pollution and Bronchitic Symptoms in Southern California Children with Asthma. Environmental Health Perspective. 107(9); 757-760

18 Etzel, R.(2003). How Environmental Exposures Influence the Development and Exacerbation of Asthma, Pediatrics Vol. 112 No. 1 July, pp. 233-239

19 Salam MT., Li Y-F., Langholz B., Gilliland FD.(2004). Early-life Environmental Risk Factors for Asthma: Findings from the Children's Health Study. Environmental Health Perspective. 112(6): 760-765

20 Institute of Medicine (IOM) Committee on Damp Indoor Spaces and Health. (2004) Damp Indoor Spaces and Health. The National Academies Press. Washington, D.C.

21 Jaakkola JJK., Hwang BF., Jaakkola N. (2005). Home Dampness and Molds, Parental Atopy, and Asthma in Childhood: A Six-year Population-based Cohort Study. Environmental Health Perspectives. Volume 113, Number 3

22 Takaro TK., Krieger JW., Song L.(2004). Effect of Environmental Interventions to Reduce Exposure to Asthma Triggers in Homes of Low-income Children in Seattle. J Expo Anal Environ Epidemiol. 2004;14 Suppl 1:S133-43.

23 Dilley J., Pizacani B., Macdonald S., Bardin J. (2005). *The Burden of Asthma in Washington State*. Olympia, WA: Washington State Department of Health. Pg: 56.

24 Ibid., pg: 57

25 Ibid., pg: 92

Parental smoking is associated with an increased risk of asthma development in children. In two large reviews of parental smoking and school-aged children, parental smoking (by either parent) was associated with an approximate 20% to 40% increased occurrence of asthma. This relationship increased proportionately with the number of smokers in the home.[26] Maternal smoking appeared to have a greater association with asthma than paternal smoking; however paternal smoking alone was still a significant risk factor. Infants exposed to secondhand smoke exhibit a higher frequency of respiratory diseases, ear infections, asthma, and sudden infant death syndrome (SIDS). Between 7,500 and 15,000 infants in the United States are hospitalized each year as a result of such diseases.[27]

The association between childhood asthma and maternal smoking during pregnancy has been inconsistent. Researchers face some difficulty in separating prenatal from postnatal exposure as most mothers who smoke during pregnancy continue to smoke after delivery. A summary review concluded that prenatal exposure may elevate risk but postnatal exposure is likely more important. Women who had successfully ceased smoking for long-term, and had no continuing household smoking, still had an 80% increased risk of asthma in their children, according to a recent study. [28]

Secondhand smoke exposure is also linked to adult-onset asthma through both cumulative lifetime and recent exposures, with risk increasing with exposure in both the home and workplace.[29] In this study, exposure in the past year in the workplace increased the risk over twofold, and at home, almost fivefold. The authors also calculated that almost 50% of new cases occurring among adults exposed to secondhand smoke during the past year were attributable to that exposure. [30]

More than 40,000 children five and under in Washington State are estimated to be exposed to Secondhand smoke in their homes. Among these children, approximately 500 new cases of asthma occurred each year as a result of the home exposure.[31] Secondhand smoke from other people's cigarettes, pipes, or cigars is related to asthma, and is more likely to occur in low income families. In Washington, exposure to secondhand smoke was significantly associated with greater asthma prevalence among youth in 6th, 8th, and 10th grades. For example, the rate of asthma among 6th graders who were not exposed to secondhand smoke was about 6%, among youth who were exposed to secondhand smoke the occurrence of asthma was about 9%. About one in ten youth with asthma reported being exposed to secondhand smoke during the past week.[32]

Smoking within a vehicle has also been identified as a risk for non-smoker passengers, in particular, children. Smoking within a confined space with limited ventilation increases the concentration of smoke that the child or passenger is breathing.

Commercial/Industrial Building Air Quality

Workplace environments contain asthma triggers and allergens that include building products, office and process equipment, chemicals, pests, and biological contaminants resulting from dampness. The health and performance of the occupants in Washington commercial buildings are linked to the quality of the environment.[33] Direct costs are measured in decreased productivity and health care costs. Indirect costs include decrease in quality of life (see *Work-related Asthma chapter* for more discussion).

School Air Quality

In the U.S. it is estimated that 56 million children and adults spend their days in elementary and secondary schools.[34] The quality of the school environment can affect the health, attendance, and performance of children and adults. Research from the Environmental Protection Agency (EPA) has shown that poor indoor air quality reduces ability in mental tasks that require concentration, calculation, or memory.[35] Refer to the *Asthma in Educational Settings* chapter for more discussion on asthma in schools.

26 Dilley J., Pizacani B., Macdonald S., Bardin J. (2005). *The Burden of Asthma in Washington State*. Olympia, WA: Washington State Department of Health. Pg: 106

27 DiFranza JR., Aligne CA., Weitzman M., (2003). Prenatal and Postnatal Environmental tobacco smoke Exposure and Childrens Health. *Pediatrics*. Apr;113(4 Suppl):1007-15.

28 Dilley J., Pizacani B., Macdonald S., Bardin J. (2005). *The Burden of Asthma in Washington State*. Olympia, WA: Washington State Department of Health. Pg: 58

29 Ibid., pg: 104

30 Ibid., pg: 104

31 Ibid., pg: 119

32 Ibid., pg: 106

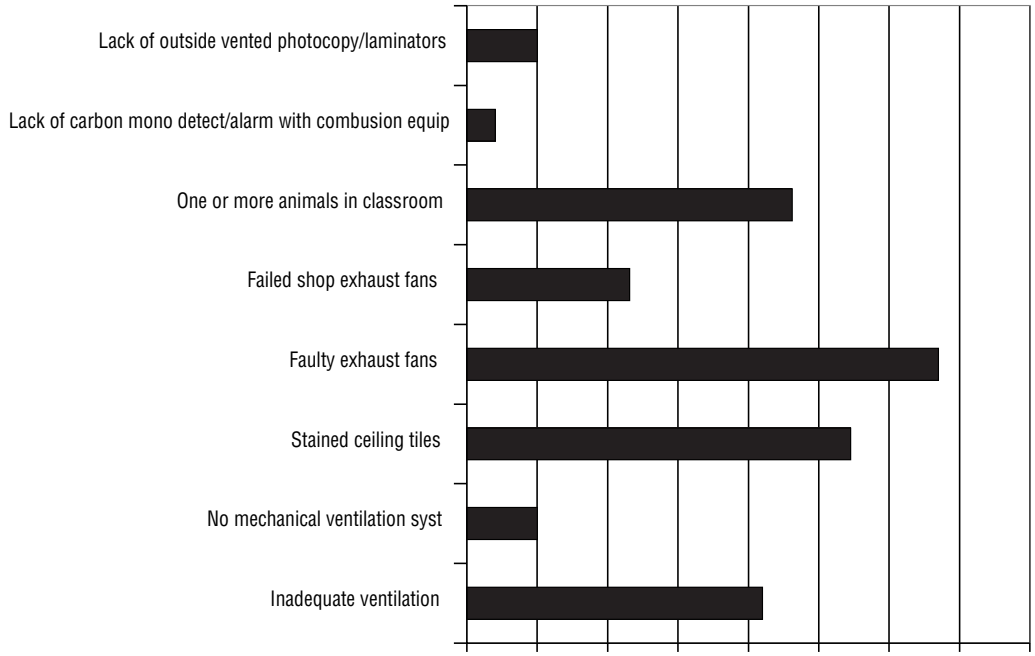
33 Fisk W., Rosenfeld A. (1997). *Improved Productivity and Health from Better Indoor Environments,* Center for Building Science Newsletter (now the Environmental Energy Technologies Newsletter), Lawrence Berkeley Labs, Summer, 5 http://eetd.lbl.gov/cbs/newsletter/NL15/productivity.html

34 Center for Disease Control, *National Health Interview Survey*, National Center for Health Statistics, 2002

35 U.S. Environmental Protection Agency, *Indoor Environments Division Office of Radiation and Indoor Air*. (2000). Indoor Air Quality and Student Performance. EPA 402-F-00-009

Asthma is the leading cause of school absenteeism due to a chronic illness, accounting for over 14 million missed school days per year in the U.S.[36] A major component of asthma management involves reducing the exposure to environmental asthma triggers through awareness, identification, and adoption of effective control measures in these school facilities. The EPA, in a 1999 General Accounting Office survey of schools reported that 43% of America's public schools reported at least one unsatisfactory environmental condition (indoor air quality, ventilation, noise, lighting, etc.) and that 25% of these schools reported unsatisfactory ventilation, and twenty percent reported unsatisfactory indoor air quality.[37]

Figure 3: School Environmental Assessments, Washington and Idaho, 2000-2001



From 2000 to 2001, 3,801 classrooms were assessed at 156 schools located in Washington and Idaho by the Washington State Energy Program. The three most common environmental issues found in the schools were faulty exhaust fans, stained ceiling tiles and animals in the classroom.[38] Faulty exhaust fans and inadequate ventilation reduces the circulation of air, decreasing air quality. Stained ceiling tiles are an indication of water leaks that increase the risk of mold development. Since many people (with or without asthma) are allergic to animals and their dander/saliva, animals in the classroom cause an environmental hazard for them that can affect their health.

In Washington State, environmental assessments in the schools have been conducted principally through three programs; the Department of Health's Indoor Air Quality Program, the Northwest Clean Air Agency, and the Washington State University Energy Program utilizing tools such as the EPA's *Tools for Schools*. These programs are designed to work with schools to identify environmental issues and provide information on how to prevent and reduce these issues.

Policy Issues

Establishing a clear link between asthma and any specific environmental exposure is often difficult. People may be exposed to multiple agents in various places that can lead to asthma development or worsen asthma. Additionally, the impact of any given exposure on an individual can be modified by their behavior and genetic susceptibility. Despite the lack of specific causal links, health investigations have found a number of agents that are associated with asthma. To protect public health, it is therefore prudent to support policies that limit exposures in the environment associated with asthma.

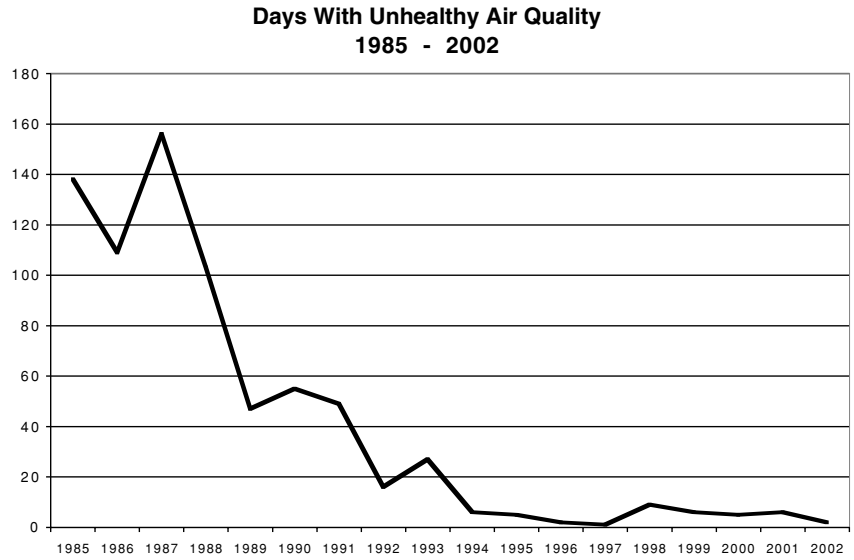
36 Environmental Protection Agency. (1999). *Indoor Air Quality Tools for Schools Fact Sheet*. EPA 402-C-99-002.

37 Environmental Protection Agency. (2000). *IAQ Tools for Schools – Managing Asthma in the School Environment*. EPA 402-K-00-003. 2000

38 Prill R., Blake D., Hales D. (2002). *School Indoor Air Quality Assessment and Program Implementation*. Proceedings, Indoor Air 2002, Monterey, CA

In Washington State, environmental policies have been effective in improving the overall quality of air, as demonstrated in the chart below. Washington air quality programs are housed at the Department of Ecology, the Department of Health and through 7 regional Air Quality Agencies.

Figure 4: Trends in 'Unhealthy Air Quality Days' in Washington State



Source: Washington State Department of Ecology. Air Quality Program. 2003

In September 2003, the governors of the three West Coast states committed to a regional greenhouse gas reduction initiative. As an initial step, the governors' staffs were directed to develop joint policy recommendations on five reduction strategies that will benefit from regional cooperation and action: hybrid vehicle procurement, reduced ports and highway diesel emissions, renewable energy, energy efficiency, and measurement and reporting.[39]

In 2004, Governor Gary Locke directed all state government agencies to purchase only low emission vehicles for state travel. The executive order also directed all diesel-powered public transportation to convert to 2 % biodiesel in an extended effort to reduce vehicle emission and diesel exhaust. Washington now grants tax deferrals and exemptions for biodiesel fuel production and sales.

Over the last few years there have been several attempts in Washington to ban smoking in public places. The most controversial was in Pierce County (Tacoma). In December 2003, the Pierce County Board of Health passed a smoke-free resolution that prohibited smoking in public places, including restaurants, bars and taverns, casinos and card rooms, and bowling alleys. The ban took effect in 2004, but a Pierce County Superior Court judge threw it out just three weeks later. A state Court of Appeals commissioner reinstated the ban the following month, and then a three-judge panel of the same court tossed it out again last June. In 2005, the Washington State Supreme Court struck down the smoking ban stating that it was in conflict with the state's less restrictive *Clean Air Act*. A citizen initiative banning smoking in all places open to the public was passed in November 2005.

In 2005, several asthma supportive policies/actions were passed by the Washington Legislature or decreed by the Governor. They included:

Asthma Awareness Month

This year, Governor Christine Gregoire proclaimed May as Washington's first "Asthma Awareness Month" encouraging the citizens of Washington to participate in asthma prevention and management.

39 *Combating Global Warming*. Governor Gary Locke. Accessed on March 4, 2004: http: //www.digitalarchives.wa.gov/governorlocke/globalwarming/globalwarming2.htm

Green Building Alternatives
Effective in July, all new and remodeled buildings are required to use green building alternatives. Washington State schools may use the Washington Sustainable Schools Protocol that includes incentives for schools to build high performance schools through green building practices.

Asthma Prevention and Management
Senate Bill 5841was adopted, instituting a more comprehensive approach to asthma prevention and management which contained three components: 1) development of a state asthma plan, 2) coordination of state purchased health care to ensure best asthma practices are employed and 3) requirements that public school districts adopt policies permitting self-carry asthma/allergy medications at schools.

Mission Standards
House Bill 1397 was adopted requiring the state of Washington to begin implementing the California vehicle emission standards in July of 2005. Also in July, landlords in Washington will be required to notify tenants of possible health effects of mold in residential units.

Current Activities

In 2003 the Tobacco Prevention and Control Program established the Secondhand Smoke Community Assistance Project to help local communities increase the number of smoke-free public places. The project team coordinates secondhand smoke reduction work in Washington and helps communities create policies to reduce exposure to secondhand smoke. The project also provides training, technical assistance, and resources. The Department of Health Tobacco program and the local Steps to a HealthierUS communities are working in partnership to encourage creation of policies that would reduce exposure to secondhand smoke and tobacco products.

Washington State is recognized nationally as a leader in promoting and adopting the EPA's Tools for Schools (TFS) program for improved indoor air quality and asthma management in schools. During the 5th Annual TFS Symposium in 2004, Washington received seven out of 22 national awards. Ephrata School District, Spokane East Valley School District, Kent School District, Spokane School District, the Washington State Department of Health, Washington State University Energy Program, and the Northwest Clean Air Agency received awards.

Winner of the EPA's 2005 Children's Environmental Health Excellence Award, the Master Home Environmentalist (MHE) program was developed in Washington State in 1992 and has been implemented in several cities in Washington. The program was designed to promote human health by increasing awareness of home environmental pollutants, allergens, and irritants and to encourage actions to reduce exposure. Program results indicate an 87% improvement with individual behaviors. The MHE program is currently available in King, Pierce, Thurston, Chelan-Douglas and Okanogan counties, and the Confederated Tribes of the Colville. Toppenish Asthma Project (1999-2000) and Childhood Asthma Project (2001-2004) at the Yakima Farm Workers Clinic used the fundamentals of MHE in evaluating all homes of children and adults with asthma.

In 2003, Washington State Legislature passed the *Clean School Bus Program* allocating $5 million per year for five years to retrofit diesel school buses with air pollution control technology that reduces toxic diesel emissions. Washington has the largest statewide, state-funded, voluntary school bus retrofit program in the country.

Another project, funded in 2004 by the Department of Ecology in partnership with the Oregon Department of Environmental Quality and Washington and Oregon's local air agencies, created the *No Idle Zone - Dare to Care about the Air* program, designed to motivate bus drivers, parents and others to turn off their engines rather than idling vehicles at schools. In 2004, it was piloted at three local schools and showed a 56% reduction in idling in school pick-up/drop-off areas when compared to the control schools.

Environmental Health

Goal 1: Assure a safer and healthier environment for persons with asthma in Washington State

Objective AE.1

Through 2010, assess prevalence of exposures to environmental asthma triggers

Strategies

- Review, implement and update as needed the Washington State Asthma Surveillance Plan to assess prevalence of exposures
- Explore the feasibility of new methods of tracking asthma and environmental exposure prevalence

Objective AE.2

Through 2007, conduct a targeted needs assessment to identify the educational needs of the public regarding environmental asthma triggers

Strategies

- Review, implement and update as needed the Washington State Asthma Surveillance Plan to assess knowledge of the public regarding environmental asthma triggers

Objective AE.3

Through 2010, increase awareness among Washington State residents of the significant impact of indoor and outdoor environmental factors in the development and management of asthma

Strategies

- Develop/implement a population-based campaign to educate the public about indoor and outdoor environmental triggers (low-income, minority programs, homes, community centers, child care facilities, elder care, schools) to include secondhand smoke materials from the tobacco programs
- Partner with coalitions and other groups conducting outreach to health care providers, employers, and the general public to include information about indoor environmental asthma triggers
- Support Master Home Environmentalist series and other effective environmental assessment trainings statewide through increasing the number of statewide MHE volunteers and trained health department staff
- Support the use of Community Health Workers (e.g. Asthma Home Educators) to expand proven effective programs such as Healthy Homes I and II, Clean Air for Kids, and Childhood Asthma Project
- Support training opportunities for the public including child care staff, parents, and schools on reducing environmental asthma triggers using programs such as Tools for Schools, the Master Home Environmentalist and Secondhand smoke publications
- Support daily air quality index information availability to the general public
- Support that environmental health education is a planned component of public health programs [40]

Objective AE.4

Through 2010, raise awareness among housing and building professionals including architects, building engineers, construction contractors, building owners/managers and maintenance staff about exposures in the environment linked to the development or worsening of asthma

40 Washington State Department of Health. (2000). *Standards for Public Health.* www.doh.wa.gov/standards

Strategies

- Develop/identify trainings and materials for housing professionals on environmental triggers of asthma
- Support education of architects, building engineers, contractors, builders, building managers, maintenance staff, and other housing professionals about the health effects of building technologies such as the need for adequate ventilation, off-gassing from building materials, and the importance of proper maintenance of building structures to prevent moisture intrusion, accumulation of dust and adequate ventilation
- Support education on "green cleaning" and integrated pest management practices
- Develop/identify incentive-based strategies for building owners/managers to create and maintain healthier living environments for residential/commercial tenants

Objective AE.5

Through 2010, decrease exposures in the indoor (car, home, schools, child care, etc.) and outdoor environment that can worsen asthma or lead to asthma development

Strategies

- Review the information gathered from the Department of Health Environmental Health Programs Office of Assessments school asthma pilot program to determine which intervention(s) are most effective
- Partner with child care agencies to provide education materials to child care providers and parents on reducing environmental triggers
- Support campaigns to implement proven strategies to reduce exposures in the environment linked to development or worsening of asthma in various settings including homes, schools, child care facilities, and community spaces
- Support opportunities for dialog with Department of Health and Human Services, Medical Assistance Program and other public payers of health care to provide coverage of Master Home Environmentalist home-based environmental assessment and education for families of children and adults
- Develop/provide model policies on addressing environmental triggers for asthma in schools, child care facilities and community programs (e.g., YMCA)
- Support school-based environmental education, assessments, and policy development and implementation in Washington schools through the utilization of evidence-based programs (such as the Asthma-Friendly Schools initiative or Tools for Schools)
- Support and encourage programs that reduce vehicle emission throughout Washington State. Use targeted interventions such as anti-idling campaigns at schools, clean vehicle standards, incentives for clean vehicles and fuels (including low sulfur fuels)
- Support policies/programs that address diesel-reduction (such as bus and heavy vehicle retrofitting, alternative fuels public transportation, etc.)
- Support evidence-based program trainings (e.g., Master Home Environmentalist) to reduce or eliminate indoor and outdoor asthma triggers for individuals with asthma, their families and the general public

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Asthma in Educational Settings

One School's Story...

In 2004, the American Lung Association of Washington (ALAW) along with the Inland Northwest Asthma Coalition (INAC) approached local schools in the Spokane, Washington area about participating in an Asthma Friendly Schools Initiative Demonstration Project.

The project is designed to assist local communities and community organizations in planning and implementing comprehensive asthma management programs within their local schools and existing school structure. At that time, schools were hesitant to participate, concerned about the already overburdened school nurse and worried that an asthma program would give schools a negative image.

Through several meetings the ALAW and INAC were able to convince Stevens Elementary that the program would greatly benefit their students, parents and the school by reducing absenteeism and creating a healthier school environment. With this, Stevens Elementary agreed to participate as a pilot site.

Through a needs assessment conducted with Stevens school key actions steps were identified which included education and support for families with asthma. In 2005, administration, staff, teachers, parents and the Spokane Public School District head custodians and school nurses were provided asthma education and a wellness carnival was held for students, parents and the community at the school.

The positive results of the program prompted the ALAW to prepare a Lung Health Took Kit for each of the 35 elementary schools in the Spokane Public School system. A Physical Education Program grant to the District was used to pay a select number of teachers to expand the curriculum to include a broader lung health approach that will be implemented by the District in the Fall of 2005.

Asthma in Educational Settings

Asthma is among the most common of the chronic diseases that affect children.[1] Especially under-treated or untreated, asthma can hinder a child's ability to attend, participate and learn in schools and/or childcare facilities (educational settings). In Washington State an estimated 120,000 youth currently have asthma and 1 in 10 households with children report having a child with asthma.[2] Most of these children and youth are enrolled in educational settings. It is estimated that children spend an average of six to nine hours a day in school or childcare facilities/programs.

Due to the frequency of asthma and the potential for serious consequences, schools and child care programs play a unique role in asthma management. All school and childcare providers must be alert to symptoms that may indicate asthma and have policies in place that help staff to assist children with managing asthma. This section focuses mainly on asthma in the school setting.

Asthma in Youth

Asthma is often first diagnosed in early childhood. Between 50% and 90% of children with asthma develop symptoms (coughing, wheezing, shortness of breath or rapid breathing, and chest tightness) before the age of five.[3] Among young children, boys are more likely than girls to have asthma. By middle school age asthma in boys drops and asthma in girls increases. This trend continues into adulthood. Hormones that become activated among females during puberty may contribute to asthma.[4]

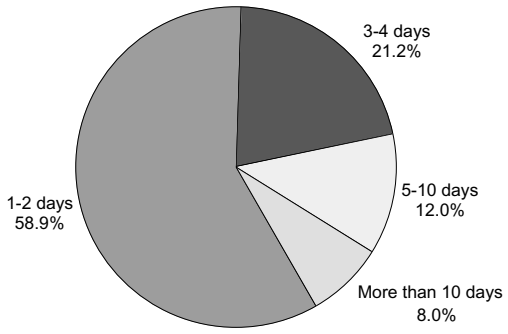
Asthma can be diagnosed at any age and for most is a life-long chronic disease. In Washington, one in seven youth with asthma reported having asthma symptoms every day.[5] Youth were more likely to visit the emergency department for asthma than adults and 8th graders were twice as likely as adults to report emergency departments/urgent care visits for asthma during the previous year.[6]

Youth with asthma also reported significantly poorer health than youth without asthma. For example, among 10th graders nearly four times as many youth with asthma reported having a long-term disability or long-term health condition, one in five youth with asthma reported that they believe other people would consider them to have a disability, and one in four (more than four times as many as 10th graders without asthma) said that they had to limit their activities because of a disability or long-term health condition.[7]

Asthma and Academic Performance and Attendance

The CDC's National Health Interview Survey estimated that 10.1 million lost days of school, 12.9 million contacts with medical doctors and 200,000 hospitalizations were directly attributed to asthma per year.[8] In Washington, not all schools track the reason a child is absent from school. However when students with asthma were asked, they reported that 59% missed one or two days, but 20% missed a week of school or more in the previous year (Figure 1) due to their asthma.[9]

Figure 1: Distribution of Days Washington Youth Missed School During the Previous Year because of Asthma, among Youth with Asthma Who Missed any School Days



Source: 2004 Washington State Healthy Youth Survey (HYS), grades 8-10-12 combined. Dilley, J., Pizacani, B., Macdonald, S., & Bardin, J. (2005). *The Burden of Asthma in Washington State*. Olympia, WA: Washington State Department of Health. Pg 19

1 Henry CN, DuPaul GJ. (2004). Pediatric Asthma Among African American Children: The Emerging Role of the School Psychologist. *NASP Communiqué*, Vol. 33, #2

2 Dilley J., Pizacani B., Macdonald S., Bardin J. (2005). *The Burden of Asthma in Washington State*. Olympia, WA: Washington State Department of Health. pg: i

3 Centers for Disease Control. (2004). Pathophysiology. *In National Asthma Training Curriculum* [CD-ROM]. Centers for Disease Control.

4 Dilley J., Pizacani B., Macdonald S., Bardin J. (2005). *The Burden of Asthma in Washington State*. Olympia, WA: Washington State Department of Health. pg: 49

5 Ibid. pg:14

6 Ibid. pg:6

7 Ibid. pg: 21

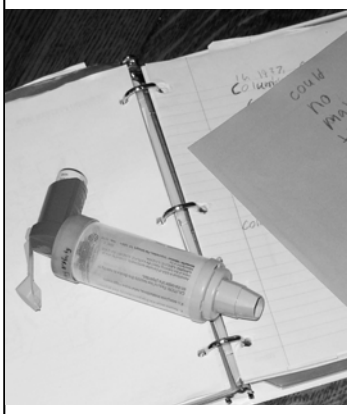
8 Department of Health and Human Services. (2000). *Action Against Asthma A Strategic Plan for the Department of Health and Human Services*.

9 Dilley J., Pizacani B., Macdonald S., Bardin J. (2005). *The Burden of Asthma in Washington State*. Olympia, WA: Washington State Department of Health. pg: 31

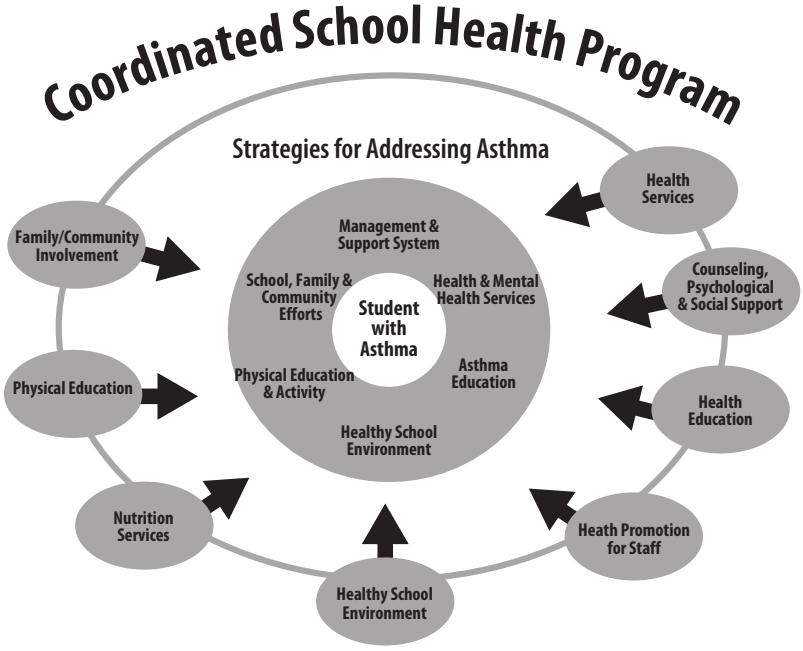
Loss of school time may contribute to poor academic performance and social development. Youth who miss school or have more severe asthma symptoms are less likely to have high academic achievement than youth with fewer asthma symptoms or those without asthma. Lower academic achievement may be related to loss of sleep due to nightly asthma symptoms and/or the medications used to control asthma may interfere with a student's ability to concentrate, increase feelings of depression and anxiety, and interfere with short-term memory.[10]

In an effort to address health in educational settings, the Centers for Disease Control and Prevention developed a model called the *Coordinated School Health Program*. Later, this model was applied to different health conditions. *The Coordinated School Health Program: Strategies for Addressing Asthma* has six core components.

1. Establish management and support services for asthma-friendly schools
2. Promote appropriate school health and mental health services for students with asthma
3. Provide asthma education and awareness for students and staff
4. Provide safe, enjoyable physical education and activity opportunities for students with asthma
5. Coordinate school, family and community efforts to better manage asthma systems and reduce school absences among students with asthma, and
6. Provide a safe and healthy school environment to reduce asthma triggers[11]



Management and Support Services for Asthma-friendly Schools



The Coordinated School Health Program identifies the following steps in managing and supporting an asthma-friendly school:

1. Designating a person to coordinate asthma activities
2. Coordination and commitment of the school district, school administration and school health team
3. Development of written policies and procedures that clearly outline how asthma will be managed during the school hours and at all school-sponsored events
4. Utilizing existing school health records to identify students with diagnosed asthma, and
5. Development of a communication system

10 Hamm EM. (2004). Managing Asthma in the Classroom. *Childhood Education Olney*: Vol. 81,Iss.1, p:16-19.

11 Centers for Disease Control and Prevention.(2002). *Strategies for Addressing Asthma within a Coordinated School Health Program, With Updated Resources*. Atlanta Georgia: Centers for Disease Control and Prevention, National Center for Chronic Disease Prevention and Health Promotion. Available at: www.cdc.gov/HealthyYouth/asthma/pdf/strategies.pdf

12 National Heart Lung, and Blood Institute. (2004). Presentation at Chest Conference Coalition Building Session. Seattle. October.

The Center for Disease Control (CDC) recommends policies that help to identify students with diagnosed asthma and focus on their health needs. A study conducted by the National Health, Lung, and Blood Institute found that well-designed screening questions for parents and children were more effective than mass screening for identifying children in schools with asthma. Policies that support population or school-based screening programs such as mass screening (e.g., spirometry lung function testing) have not been recommended or supported by the World Health Organization or the American Academy of Pediatrics.[13, 14]

Policy changes can be made both at the school district or individual school level. Changes could be made upon reviewing how children have access to asthma medications, providing adaptations in physical education, providing teacher and staff education and reducing asthma-specific triggers in the school. A resource for school districts is the CDC School Health Index.

School Absenteeism Tracking

Tracking absenteeism can be an important tool for schools to help identify trends in asthma related missed days. Absenteeism data that tracks the reasons, even if in broad categories, can help schools identify children who are having a particular problem at home or at school. Children with asthma who are frequently absent may not be taking their medications correctly or children with asthma may be going home in the middle of the day due to an exposure at school, which is worsening their asthma. If this information is not tracked, then issues are not readily identified and cannot be addressed.

Currently, there is no uniform mechanism to track the reasons for school absences in Washington State. In 2002 the Department of Health received a CDC Environmental Public Health Tracking Network to support electronic data development activities. One of the activities funded was the development of a standardized electronic school-based collection of student health and environmental quality data in three pilot school districts in Washington State. The goal of this initiative is the development of sustainable models for the systematic collection of electronic student health and indoor air quality data related to asthma and asthma-like conditions among students. The pilot included four primary data streams:

- Student absenteeism data by broad categories including asthma or asthma-like conditions
- Chronic student health conditions data, which includes asthma
- School nursing room student visit information, and
- School indoor environmental quality data.

These activities support characterization of student asthma rates, attack frequency, and reasons for absenteeism in schools as well as indoor air environmental factors associated with asthma. This ongoing initiative has provided many benefits in pilot school districts. It has shown to be cost effective and outlined the need for electronic school health and environmental tracking. The program is being explored for statewide expansion.

Appropriate School and Mental Health Services for Students with Asthma

Policies requiring an asthma action plan (also called an asthma management plan) and medical/treatment orders for every student with asthma should be in place and enforced to address the health needs of children with asthma in educational settings. This requires a coordinated effort between the health care provider, the community, the parent/guardian and the schools. Currently, school/district policies that address screening, development and implementation of individual health plans and emergency treatment plans for students with asthma are inconsistent throughout Washington's school systems.[15]

13 Centers for Disease Control and Prevention.(2002). *Strategies for Addressing Asthma within a Coordinated School Health Program, With Updated Resources*. Atlanta Georgia: Centers for Disease Control and Prevention, National Center for Chronic Disease Prevention and Health Promotion.

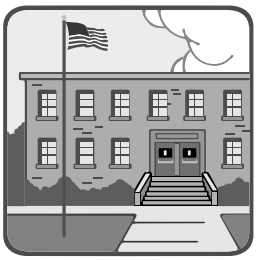
14 Wheeler L, Boss LP, Williams PV. (2004). School Based Approaches to Identifying Students with Asthma. *Journal for School Health*. 74(9)

15 Dilley J., Pizacani B., Macdonald S., Bardin J. (2005). *The Burden of Asthma in Washington State*. Olympia, WA: Washington State Department of Health. Pg 96

In 2002, Washington State passed the *Children with Life-threatening Health Conditions- Medical or Treatment Orders* law (RCW 28A.210.320) which stated that children with life-threatening health conditions must have a medication or a treatment order in place prior to their first day of school. The law defines life-threatening as "…a health condition that will put the child in danger of death during the school day if a medication or treatment order and a nursing plan are not in place." About 11% of the students identified with asthma were classified by school nurses as having "life-threatening asthma."[16] Children with severe asthma are typically identified as having life-threatening illness for the school setting, those with mild asthma may not be. Since one-third of fatal asthma episodes occurred in children with mild asthma, school nurses must understand that students and parents may not view mild asthma as critical and therefore may not adhere to asthma medications or recognize asthma symptoms resulting in an acute asthma attack.[17] Without medical or treatment orders (asthma action plans) these children may not have access to the rescue medications at school.

How Asthma Action and Emergency Care Plans are Different and Developed

School Nurse



Asthma Action Plan

A written, easy-to-understand description of how to manage an asthma exacerbation, including information that outlines the early signs of worsening asthma, the medications to use and how to use them, and specific instructions for when to contact the clinician or emergency department. Parent/Guardian's Role

Health care provider prepares and the parent signs

Parent/Grardian's Role

Emergency Care Plan

A plan drafted and implemented by the school nurse utilizing the asthma action plan to inform and train school personnel and to monitor and supervise the treatment and medication needs of the student.

School-based document. Drafted by the School Nurse in coordination with the parents and health care provider.

Data suggests that some students in Washington with asthma do not have emergency care plans.[18] The lack of resources to provide adequate nursing support, and communication challenges among parents, school nurses, and health care providers explain why more prevention plans are not in place for students with asthma, including those not classified as having "life threatening" asthma.

Asthma action plans have been accepted and utilized by clinicians and have been shown to result in fewer emergency room visits and hospitalizations for their patients with asthma. However, not all students have asthma action plans in place from their doctor.[19] The 2004, Washington State Healthy Youth Survey (HYS), combined results for 8th, 10th and 12th grade students found that about one-third of youth with asthma had received a written asthma plan

16 Dilley J., Pizacani B., Macdonald S., Bardin J. (2005). *The Burden of Asthma in Washington State*. Olympia, WA: Washington State Department of Health. Pg: 93

17 Stempel DA (2003). The Pharmacologic Management of Childhood Asthma. *Pediatric Clinics of North America*. 50(3): 610–629.

18 Dilley J., Pizacani B., Macdonald S., Bardin J. (2005). *The Burden of Asthma in Washington State*. Olympia, WA: Washington State Department of Health. pg:96

19 Ting S. (2004). Multicolored simplified asthma guideline reminder (MSAGR) for better adherence to national/global asthma guidelines. *Clin Rev Allergy Immunol*. Oct;27(2):133-45.

from their health care provider. An additional 24% did not know whether they had received a plan, but as the purpose of the plan is to provide instruction about pharmaceutical and self-management strategies, the plan can only be considered effective if a person is aware of it. More discussion of asthma action plans can be found in the *Health Care* chapter.

In 2005, the state legislature passed a law (28A.210 RCW) requiring the Office of the Superintendent of Public Instruction and the Washington State Department of Health to develop a uniform policy for all school districts providing for in-service training for school staff on symptoms, treatment, and monitoring of students with asthma and the additional observations that may be needed in different situations that may arise during the school day and during school-sponsored events. All school districts must adopt policies regarding asthma rescue procedures for each school within the district and each public elementary school and secondary school must grant to any student in the school authorization for the self-administration of medication to treat that student's asthma or anaphylaxis.

Although change in policies may occur through legislative action, they must be implemented at local level and reflect local need. The Office of Superintendent of Public Instruction (OSPI), offers school districts guidance about developing procedures that permit a student to carry his/her own medication and/or to self-administer the medication. These procedures typically involve a licensed health professional and parent/ guardian.

OSPI recommends that the school district consider

- Who approves the student self-administration, and
- The developmental/grade level of students permitted to self-administer medications.

The district may want to consider permitting students at certain grade or developmental levels to carry their own medication, prescription and/or over-the-counter medication. These determinations are within the purview of local school administration[20]

The Role of the School Nurse in Washington

School nurses provide support services to students with a variety of health conditions, including asthma. The numbers of children with special health care needs in schools and the demands for schools to make accommodations and provide care for them are rising. School staff request health information from parent(s), at the beginning of the school year. If information is not provided by the parent(s), it is unlikely that the school nurse will be aware of a student with asthma. In Washington, the estimated asthma prevalence among K-12 students using parent-reported data was about 5% in comparison to 8-9% student asthma prevalence as reported by youth.[21]

The CDC recommends that a full-time registered nurse be available all day, every day at each school.[22] Healthy People 2010, recommends a Nurse-to-Student Ratio of at least 1:750.[23] The National Association of School Nurses also recommends a student ratio of 1 nurse for every 750 general population students.[24] In Washington State, it is the recommended goal to implement the Staffing Model for the Delivery of School Health Services. The staff model consists of a nursing assessment to determine levels of care needed for individual students in a school (utilizing severity coding) and an overall school district model with staffing level recommendations (minimum 1 to 1,500).[25] Washington State falls far short of these goals. In rural districts many schools have access to a nurse only half a day or less per week, and nurses may be driving hundreds of miles a week to service these schools. Iin large districts, a nurse may serve multiple schools, spending one day per week at each site.

Washington State school nurses are mandated to set up care plans for all children with life-threatening conditions before the school year begins. Nurses must first identify and prioritize these students. Many times students with "mild" asthma may be moved to the bottom of the priority list unless they are in crisis.

20 Office of the Superintendent of Public Instruction. *Bulletin No 34-01 Learning and Teaching Support*. June 2001 http://www.k12.wa.us/HealthServices/pubdocs/b034-01.pdf.

21 Dilley J., Pizacani B., Macdonald S., Bardin J. (2005). *The Burden of Asthma in Washington State*. Olympia, WA: Washington State Department of Health. pg: 83

22 Centers for Disease Control and Prevention.(2002). *Strategies for Addressing Asthma within a Coordinated School Health Program, With Updated Resources.* Atlanta Georgia: Centers for Disease Control and Prevention, National Center for Chronic Disease Prevention and Health Promotion.

23 CDC NCHS 1998 National Health Interview Survey, as cited in Department of Health & Human Services. *Healthy People 2010*. 2nd ed. Washington, DC: U.S. Government Printing Office, Nov 2000: page 24-18.http: //www.healthypeople.gov/stat_107obj.htm.

24 National Association of School Nurses. *Position Statement: Caseload Assignment* http: //www.nasn.org/positions/caseload.htm

25 Centers for Disease Control and Prevention.(2002). *Strategies for Addressing Asthma within a Coordinated School Health Program, With Updated Resources*. Atlanta Georgia: Centers for Disease Control and Prevention, National Center for Chronic Disease Prevention and Health Promotion.

School nurses' responsibilities include identifying students with asthma and setting up the individual and emergency health care plans and accommodations in coordination with the health care provider, parent, school personnel, and students. School nurses educate school staff on these children's special needs, and provide and/or monitor and supervise provision of medical treatments and medication administration. Services being provided may include peak flow monitoring, administration of rescue inhalers, nebulizer treatments, student health counseling, and negotiating classroom accommodations. The role of the school nurse is paramount in ensuring that students with asthma are safe at school.

Role of the School Counselor

School counselors, along with school nurses, can assist in supporting students with chronic disease (such as asthma) who have depression. Washington's Healthy Youth Survey (8th, 10th and 12th grades) reports that among youth with asthma, 39% reported being depressed and 24% reported thinking about suicide during the past year. These estimates are significantly greater than for youth without asthma.[26] Depression may be linked to perceived or real physical limitations related to having asthma. Further study on the link between asthma and depression need is needed.

Asthma Education and Awareness for Students and Staff

Schools can play an important role in providing increased education to parents of children with asthma; especially those recently diagnosed who are presenting at the school with asthma medications for the first time. Schools could enhance parents' understanding of effective management of asthma that includes four components:

1. Avoiding or controlling the factors that may make asthma worse (for example, environmental and occupational allergens and irritants),
2. Taking appropriate medications tailored to the severity of the disease,
3. Objective monitoring of the disease by the patient and the health care professional, and
4. Actively involving people with asthma in managing their own disease.[27]

Use of rescue medications, school absences of children with asthma, and/or self-restriction from physical activities can be indicators of under-treated or unmanaged asthma. Schools can assist in identifying students and families that may need additional assistance in asthma self-management. Asthma self-management programs have shown dramatic improvements in the functional status and school performance of children who have asthma when comprehensive school-based asthma programs have the following elements:

- Focus on symptoms, grades, and school absences of children,
- Asthma management practices which involve the child(ren), their parents, classmates, and
- School personnel trained and encouraged to be involved in disease management.[28]

The Global Initiative for Asthma recommends that "…specific advice about asthma and its management should be offered to school teachers, (and) physical education instructors..."[29] Several asthma curriculums exist to assist children living with asthma and their families. Children benefit from these programs by having reduced asthma-related absenteeism, fewer daytime symptoms, higher grades in science, and higher scores on an asthma management index.[30]

Amy Van Dyken (b. 1973)

American swimming champion

Amy Van Dyken's doctor suggested she start swimming to relieve her severe asthma. Diligent training and asthma medications helped her become the first American woman to win four gold medals in one Olympic Games.

Courtesy Reuters/Gary Hershorn/Archive Photos.

26 Dilley J., Pizacani B., Macdonald S., Bardin J. (2005). *The Burden of Asthma in Washington State*. Olympia, WA: Washington State Department of Health. pg: 36

27 Ibid. pg: 63

28 Department of Health and Human Services. (2000). *Action Against Asthma A Strategic Plan for the Department of Health and Human Services*. Pg. 21

29 *Global Initiative for Asthma* National Institutes of Health. National Heart, Lung, and Blood Institute. 2002:90

30 Clark NM., Brown R., Joseph CL.,, Et al. (2004). Effects of a Comprehensive School-Based Asthma Program on Symptoms, Parent Management, Grades, and Absenteeism. *Chest*.25: 1674-1679

Safe, Enjoyable Physical Education and Activity Opportunities

Asthma symptoms have been reported as a cause of restricting physical activity. In preschoolers, learning and socializing opportunities are likely to be impaired if they are unable to join in normal activities with their peers because of asthma.[31] A study conducted by the CDC found that almost 30 percent of children with asthma reported experiencing physical activity limitations compared with only 5% of children without asthma.[32]

Educated school staff can help children with asthma keep active and maintain involvement with their peers. Adults at school can monitor symptoms, help to reduce triggers, ensure medication is easily accessible and is used (when indicated) before physical activity, and modify activities when needed. These adults might include nurses, teachers, para-educators, parent volunteers, administrators, childcare center employees, school coaches, bus drivers and band/chorale directors.[33] Additionally, maintenance staff and others should receive training in exposures in the school environment that can lead to the development of worsening of asthma.

Physical activity is important to all children; however, it is especially important for the children with asthma because strenuous exercise strengthens and stretches the airway that helps to maintain elasticity.[34, 35, 36] Asthma diagnosis can sometimes be utilized by children to self-exclude themselves from physical activities. Children with well-maintained asthma should be able to participate in physical activities. If the planned activity is outdoors, it is important to have an asthma action plan (in schools this may be called an individual health plan) in place to raise awareness of asthma triggers that a child may come into contact with while exercising (e.g., grasses, air pollution).

Additionally, lack of exercise can contribute to obesity in children. Multiple studies, including a few longitudinal studies, suggest an association with being overweight/obese and a higher prevalence of asthma or greater risk of developing asthma, especially in females.[37, 38, 39] It has also been shown that a reduction of weight can improve lung function, asthma symptoms, morbidity, and health status.[40, 41] The prevalence of obesity in the United States and Washington State has doubled over the past decade. In Washington State, 21% of high school students were overweight or at risk of becoming overweight.[42]

Coordinated School, Family and Community Efforts to Better Manage Asthma Symptoms and Reduce School Absences

Although it is uniformly understood that the well-being of children is primarily the responsibility of the family, a shared responsibility for the whole community and all of its institutions \ is widely recognized.[43] Schools, parents, teachers and school-based organizations can assist with asthma education, encourage school policies that address asthma prevention (reduction of asthma triggers) and can provide referrals for families with asthma.

Safe and Healthy School Environment to Reduce Asthma Triggers

Children with asthma can be affected by environmental factors in the school setting. Asthma attacks and related health outcomes can be linked with environmental causes (triggers) such as air pollutants, temperature extremes, sights, sounds, and odors. These environmental triggers may also contribute to poor academic performance.[44]

Reduction of asthma triggers in the school (such as molds) can help provide a healthy school environment that supports learning. This may also benefit the health of other children. The Environmental Protection Agency (EPA) recently completed a literature search and found

31 *Global Initiative for Asthma* National Institutes of Health. National Heart, Lung, and Blood Institute. 2002:20

32 Taylor WR., Newacheck PW. (1992). Impact of Childhood Asthma on Health. *Pediatrics* 90:657-62

33 Center for Disease Control and Prevention. *National Asthma Training Curriculum*. CD-ROM 2005

34 rostoff J., Gamlin L. (2000). Asthma: The Complete Guide to Integrative Therapies. *Healing Arts Press.* Rochester, VT. 68

35 Welsh L., Kemp JG., Roberts RG. (2005). Effects of Physical Conditioning on Children and Adolescents with Asthma. *Sports Med*.35(2):127-141.

36 Welsch L., Kemp JG., Roberts RG. Department of Respiratory Medicine, Royal Children's Hospital, Melbourne, Victoria, Australia School of Exercise, Australian Catholic University, Melborne, Victoria, Australia. *Effects of Physical Conditioning on Children and Adolescents with Asthma*.

37 Camargo CA Jr., Weiss ST., Zhang S., et al. (1999). Prospective Study of Body Mass Index, Weight Change, and Risk of Adult Onset Asthma in Women. *Arch Intern Med.* 159:2582-8.

38 Shaheen SO. (1999). Obesity and Asthma: Cause for Concern? *Clin Exp Allergy*. 29:291-3.

39 Huang SL., Shiao G., Chou P. (1999). Association Between Body Mass Index and Allergy in Teenage Girls in Taiwan. *Clin Exp Allergy*. 29:323-9

40 Stenius-Aarniala B., Poussa T., et al. (2000) Immediate and Long Term Effects of Weight Reduction in Obese People with Asthma: Randomized Controlled Study. *BMJ:* 320:827-32

41 Hakala K., Stenius-Aarniala B., et al. (2000). Effects of Weight Loss on Peak Flow Variability, Airway Obstruction, and Lung Volumes in Obese Patients with Asthma. *Chest;118:1315-21*

42 Washington State Department of Health. *Obesity in Washington.* 8/31/2004. http://www.doh.wa.gov/cfh/CWP/Fact_Sheets/FS_Obesity.pdf

43 National Parent Teacher Assocation. *Healthy Children, Successful Students Comprehensive School Health Programs*. www.pta.org/parentinvolvement/healthsafety/hs_healthprogram.asp

44 Mendell MJ., Heath G. (2004). *A Summary of Scientific Findings on Adverse Effects of Indoor Environments on Students' Health, Academic Performance and Attendance*. Prepared for US Dept of Education

evidence suggesting schools and other settings with indoor air pollution or inadequate ventilation can decrease student and teacher performance.[45] These studies reinforce others that relate decreases in indoor air quality with increased frequency of adverse health symptoms or absenteeism. Indoor air quality management in schools, including pollutant source control and provisions for adequate ventilation, appear to improve student and teacher health, increase school attendance, and improve student performance. Correcting the pervasive problem of inadequate ventilation in schools provides a significant opportunity to improve school conditions and lead to improved performance of teachers and students alike.

The Role of Educational Facilities Staff

The quality of the school learning environment can have a significant effect on student health and consequently on learning and performance. The school learning environment is affected by numerous factors including air quality and physical parameters such as temperature and humidity, which may diminish an individual's attention, memory, cognitive function, physical health and comfort. With regard to asthma, inhaled particulate matter (animal dander, dusts, molds, etc) can have a significant impact on student asthma events in terms of numbers and severity. Students and staff perform at their best in environments that are safe, clean and orderly including well-ventilated, lighted and maintained classrooms.[46] Facilities staff can play a vital role in the air quality and overall health of the school building by accomplishing day-to-day cleaning and long-term maintenance of school facilities.

Some indoor air quality problems may not be preventable, but can be reduced when well-trained staff and adequate resources are in place to assist in early problem identification.[47] Anecdotal evidence suggests that school funding cuts in many areas of the state have reduced cleaning frequency and resulted in the deferment of long-term facility maintenance projects.[48] These trends are likely to adversely impact indoor air quality in affected schools.

Given the overall rise in the rate of children with asthma in recent years, greater emphasis should be placed on improving and maintaining school environmental quality through the provision of adequate resources, monitoring for and providing timely maintenance repairs.

In Washington State at least three programs have been implemented to address asthma environmental trigger identification in the school setting. These programs are the Washington State University Energy Program Indoor Air Quality Program, the Washington State Department of Health's Tools for Schools, and the Spokane Asthma-Friendly Schools Initiative Demonstration project.

Please refer to the *Asthma and the Environment* chapter for more discussion on school environments.

Smoking and Asthma

Since tobacco smoke is a trigger for asthma, the Washington State Department of Health's (DOH) efforts to youth focused efforts to reduce tobacco use are important to reducing exposure to a contributor to asthma. Studies have shown that 45 children in Washington State start using tobacco every day and one-third of them will eventually die from tobacco-related diseases. The DOH Tobacco Prevention and Control Program conducts a comprehensive, innovative, and diverse campaign to prevent youth from beginning tobacco use. As a result of these efforts, there are about 65,000 fewer Washington kids smoking than before the program began in 1999.[49] Schools can play a role in reducing smoking in youth through participating in youth tobacco cessation and prevention programs.

For a more complete discussion on environmental triggers, including smoking and environmental assessments in the schools see the *Asthma and the Environment* chapter.

Trigger

A factor that may bring on or increase the signs and symptoms of asthma.

45 Environmental Protection Agency. *EPA Indoor Air Quality and Student Performance Fact Sheet*. 8/30. Publication number 402-K-03-006. http://www.epa.gov/iaq/schools/images/iaq_and_student_performance.pdf

46 US Department of Education, National Center for Educational Statistics, National Forum on Education Statistics. (2003). *Planning Guide for Maintaining School Facilities*. NCES 2003-347, prepared by Szuba T., Young R., and the Schools Facilities Maintenance Task Force. Washington DC. pg. 8

47 Ibid. pg 45

48 Personal communications with Glen Patrick, Washington State Department of Health

49 Washington State Department. (2005) *Tobacco Prevention and Control Program Progress Report*. http://www.doh.wa.gov/Tobacco/youth/youth.htm

Current Activities

In Washington several projects have aimed at addressing asthma in the schools, some of these are listed below.

Asthma Management in Educational Setting (AMES) is a comprehensive guide to asthma for school nurses. AMES is a tool utilized by schools to identify recommendations and policies and to obtain Washington State resources to address asthma. It was developed by the Washington Asthma Initiative (WAI) in 2001 and updated in 2004. In 2005, the guide was placed on a CD-ROM and distributed to every school in Washington State.

In 2003, the Washington State Legislature passed the *Clean School Bus Program* that allocated $5 million per year for five years to retrofit diesel school buses with air pollution control technology that reduces toxic diesel emissions. Washington is the largest statewide, state-funded, voluntary school bus retrofit program in the country.

Vehicle-related air pollutants are associated with thousands of cases of chronic respiratory illness and cardiovascular problems.[50] In 2004, the Department of Ecology, in partnership with the Oregon Department of Environmental Quality and Washington and Oregon's local air agencies, created the *No Idle Zone - Dare to Care About the Air* program. This program is designed to motivate bus drivers, parents and others to turn off their engines rather than idling vehicles at schools. In 2004, it was piloted at three local schools and showed a 56% reduction in idling in school pick-up/drop-off areas when compared to the non-studied schools.[51]

Asthma in the Educational Settings

Goal 1: Increase the number of 'asthma-friendly' schools in Washington State

Objective AES.1

By 2010, increase the number of schools reporting policies in place that implement emergency care plans for all identified students with asthma

Strategies

- Connect schools with medical providers to provide coordination of care, action plans and medications
- Collaborate with OSPI and other key stakeholders to address asthma prevention and management in the school
- Support policies that improve school health services for students with asthma including increased school nurse services
- Work with health care provider groups to develop a consensus statement that all asthma diagnoses in children are considered to be life-threatening
- Develop a model policy consistent with federal and state guidelines for utilization by school districts to implement asthma management/action plans for all children with asthma in the school-setting
- Support policies that provide specific care information to all school personnel responsible for the health and safety of children with asthma during the school day (e.g., bus drivers, teachers, other staff)
- Develop policies that require all school staff (including bus and playground personnel) to have been trained, received delegations, and been supervised by a Registered Nurse to administer asthma medications safely and accurately
- Create/identify and promote school-based asthma training manuals for utilization by all school staff

50 American Lung Association. *State of the Air 2004*. http://lungaction.org/reports/sota04_table2.html

51 Department of Ecology Air Quality Program. (2005) *Anti Idling Campaign. Dar to Care About the Air*. PRR: Seattle, WA

- Promote the utilization of the *Asthma Management in the Educational Setting* (AMES) manual and/or other asthma related school-based resource materials (e.g., Asthma-Friendly Schools)
- Provide safe, enjoyable physical education and activity opportunities for students with asthma which includes access to medication prior to and during activities[52]
- Educate, support and involve family members in efforts to reduce students' asthma symptoms and school absences[53]
- Support policies that decrease the nurse/student ratio to more closely comply with the national ratio
- Support policies that require a significant increase in the number nursing and facility staff hours available in each school building

Objective AES.2

By 2007, expand asthma-related school-based data collection systems in Washington State

Strategies

- Revise the CDC's school health evaluation program or other available school-based data collection systems to include asthma-related assessment of primary schools in Washington State
- Explore possibilities of collecting uniform data on asthma-related school absences through existing or new data collection systems.

Objective AES.3

By 2010, increase the number of schools utilizing an evidence-based school environmental assessment program

Strategies

- Develop a model policy requiring schools to conduct yearly environmental assessments to reduce asthma triggers in the school-based setting
- Expand resources to support the use of Tools for Schools program and/or other environmental assessment programs designed to identify, evaluate and mitigate environmental issues in the schools
- Increase the utilization of integrated pest management techniques to control pests in the schools[54]
- Provide technical assistance to schools for low-cost environmental solutions/resources
- Increase the number of school-based science labs that report limited stock of chemicals in the classroom
- Partner with schools to design and implement facility and grounds maintenance polices and protocols that promote a healthy school environment

52 Centers for Disease Control and Prevention.(2002). *Strategies for Addressing Asthma within a Coordinated School Health Program, With Updated Resources*. Atlanta Georgia: Centers for Disease Control and Prevention, National Center for Chronic Disease Prevention and Health Promotion.

53 Einhorn E., DiMaio M. (2000). An Interdisciplinary Program to Control Pediatric Asthma. *Continuum*;8-13

54 Centers for Disease Control and Prevention.(2002). *Strategies for Addressing Asthma within a Coordinated School Health Program, With Updated Resources*. Atlanta Georgia: ters for Disease Control and Prevention, National Center for Chronic Disease Prevention and Health Promotion.

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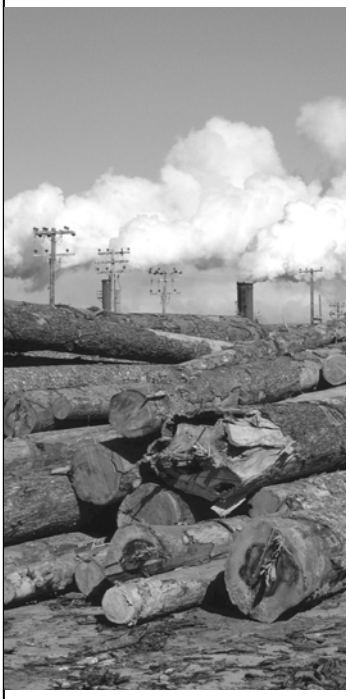
Work Related Asthma



One Washington Worker's Story...

"Jim" is a sawmill worker in his early thirties. He developed symptoms of shortness of breath and itching about one year after he started working in a mill that processed Western Red Cedar. At first, his symptoms were mild and sporadic and would clear over the weekends. His symptoms worsened over the next two years and he finally decided to seek treatment.

Jim's physician conducted several tests and diagnosed him with allergies and asthma caused by Western Red Cedar. Due to his sensitization to a chemical called plicatic acid in the wood's dust, his physician believed it would be in Jim's best interest to remove him from the workplace.

Jim was off work for an extended period of time while he underwent vocational retraining to gain employment in another trade. The total workers' compensation costs for this claim, including reimbursement for medical expenses and lost time from work, exceeded $63,000.

Work Related Asthma

Work-related asthma is a significant and preventable public health problem and was included as a priority condition in the first decade of the National Occupational Research Agenda (NORA).[1] In occupational medicine clinics; occupational asthma is the most frequently diagnosed occupational respiratory disease.

Work-related asthma can generally be categorized into three main types:

1. **Occupational Asthma** – new-onset asthma resulting from sensitization to a substance at work after a period of latency, also referred to as sensitizer-induced or immunologic asthma.
2. **Reactive Airways Dysfunction Syndrome (RADS)** – new-onset asthma symptoms immediately following exposure to high levels of an irritant in the workplace,[2] also referred to as non-immunologic or irritant-induced asthma.
3. **Work-Aggravated Asthma** – pre-existing asthma that is exacerbated by chemicals, smoke, fumes, or dust in the workplace.

Past surveillance and research of work-related asthma has resulted in significant knowledge of the causes and triggers of asthma generally. This is partly due to the fact that workers are exposed to a vast array of chemicals, sometimes at high levels or for extended periods of time.

It has been suggested that much can be learned regarding the causes, exacerbation, management and cure of asthma in the general population from continued study of asthma in the workplace.[3]

Work-related asthma is the most common occupational lung disease and can cause significant morbidity and disability. The proportion of adult asthma that can be attributed to workplace exposures has been estimated to be about 15%.[4-6] These estimates include both occupational asthma as well as work-aggravated asthma.

In Washington State, a total of 1,377 workers' compensation claims were filed for work-related asthma during the eight-year period from 1995-2002.[7] Over half the claims (57%) were filed by women, and claimants ranged in age from 15 to 77 years, with an average age of 41 years.

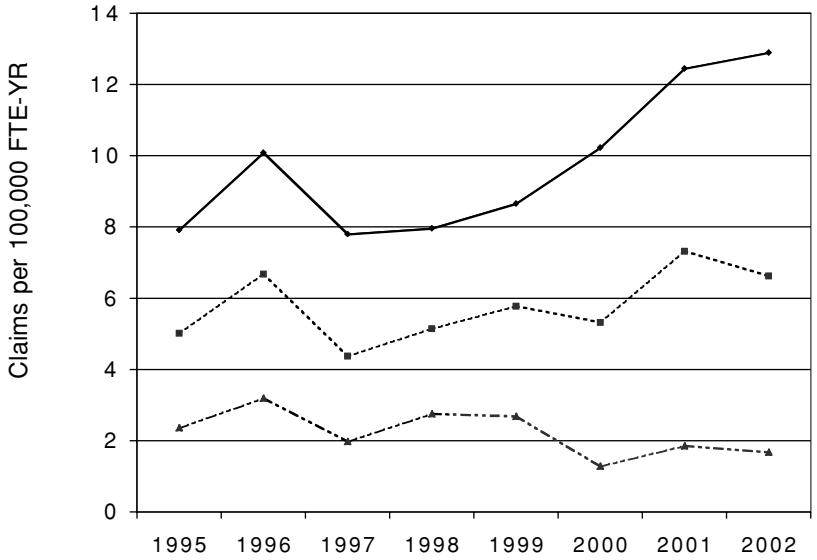
Costs incurred by the 1,099 work-related asthma claims paid by the state-operated workers' compensation system (i.e., State-Fund) totaled $12 million, or an average of nearly $11,000 per claim. Over $5 million of the total costs went toward reimbursement of almost 79,000 lost workdays, and $1.2 million went toward permanent partial disability payments for workers who developed permanent breathing problems.

The workers' compensation claims rate for filed claims related to asthma increased significantly from 7.9 to 12.9 per 100,000 per full-time equivalent employees (FTE) during 1995-2002 period (see Figure 1). The rate of accepted claims also increased from 5.0 to 6.6 per 100,000 FTE. The rate of compensable claims (i.e., those claims with at least 4 lost workdays) decreased over this time period.

These trends suggest an increasing incidence of work-related asthma claims in Washington, despite an overall decreasing incidence rate for all cause State-Fund claims.[7-8]

1. National Institute for Occupational Safety and Health. *National Occupational Research Agenda: Asthma and Chronic Obstructive Pulmonary Disease Additional Information*. Accessed at: http://www2a.cdc.gov/nora/NaddinfoAsthma.html on June 21, 2005.
2. Brooks SM, Weiss MA, and Berstein IL. (1985). Reactive Airways Dysfunction Syndrome (RADS): Persistent Asthma Syndrome after High Level Irritant Exposures. *Chest*, 88(3): 376-384.
3. Petsonk EL. (2002). Work-Related Asthma and Implications for the General Public. *Environmental Health Perspectives*, 110(suppl 4): 569-572.
4. Blanc PD and Toren K. (1999). How Much Adult Asthma Can Be Attributed to Occupational Factors? *American Journal of Industrial Medicine*, 107(6):580-587.
5. Mannino DM. (2000). How Much Asthma is Occupationally Related? *Occupational Medicine: State of the Art Reviews*, 15(2): 359-369.
6. Balmes J, Becklake M, Blanc P, Henneberger P, Kreiss K, Mapp C, Milton D, Schwartz D, Toren K, Viegi G; Environmental and Occupational Health Assembly, American Thoracic Society. (2003). American Thoracic Society Statement: Occupational contribution to the burden of airway disease. *American Journal of Respiratory and Critical Care Medicine*, 167(5):787-97.
7. Curwick C and Bonauto D. (2003). Work-Related Asthma in Washington State: A Review of Workers' Compensation Claims from 1995-2002. Technical Report Number 64-6-2003. Safety & Health Assessment & Research for Prevention (SHARP) Program, Washington State Department of Labor and Industries, Olympia, Washington.
8. Silverstein B, Kalat J, Fan ZJ. (2003). *Work-related Musculoskeletal Disorders of the Neck, Back, and upper Extremity in Washington State, State Fund and Self Insured Workers' Compensation Claims, 1993-2001*. Technical Report 40-7-2003. Safety & Health Assessment & Research for Prevention (SHARP) Program, Washington State Department of Labor and Industries, Olympia, Washington.

Figure 1: Trend in Work-Related Asthma Claims Rates, Washington Department of Labor and Industries' State-Fund Workers' Compensation Claims Data



Source: *The Burden of Asthma in Washington State Report*. DOH 2005.

Work-related asthma occurs in a very large number of industries as a result of a diverse array of exposures. In order to make a measurable impact on the morbidity of work-related asthma in Washington, multiple industries and hazards must be targeted for prevention. The following types of work are highlighted as high priorities based on relatively high workers' compensation claim frequencies and rates: sawmills; the manufacturing of plastic, wood, and fiberglass products; clerical work in state government; and medical clinics.[7] Other industries identified as potential priorities for intervention include the spray-on truck bed lining industry[9] and auto body repair shops10, both of which have workers exposed to isocyanates, well-documented respiratory sensitizers.

Fifty-seven percent of workers' compensation claims for work-related asthma are filed by women.[7] This is in contrast to the much lower proportion of all workers' compensation claims that are filed by women (32%).[8] This finding appears to be consistent with results from the BRFSS survey that reveal a higher prevalence of asthma among adult women (11.2%) compared to men (6.9%).

Environmental Factors

According to the criteria established by the Association of Occupational and Environmental Health Clinics for designating substances as occupational asthmagens, there are currently over 350 substances known to cause asthma in the workplace.[11] These include chemicals, dusts, metals, plant and animal materials, and proteins, among others. Table 2 provides a listing of selected asthmagens and the common occupations where exposures occur.

9. Lofgren DJ, Walley TL, Peters PM, Weis ML. (2003). MDI Exposure for Spray-On Truck Bed Lining. *Applied Occupational and Environmental Hygiene*. 18:722-779.
10. Sparer J, Stowe MH, Bello D, Liu Y, Gore RJ, Youngs F, Cullen MR, Redlich CA, Woskie SR. (2004). Isocyanate Exposure in Autobody Shop Work: The SPRAY Study. *Journal of Occupational and Environmental Hygiene*. 1:570-581.
11. Beckett WS. (2002). *Revised Protocol: Criteria for Designating Substances as Occupational Asthmagens on the AOEC List of Exposure Codes*. Accessed from: http://www.aoec.org/Asthmagen_Pro_7-25-02.pdf on January 24, 2005.

Table 2: Selected Causes of Occupational Asthma and

Typical Occupations Related to Exposure

Asthma Causing Agent	Occupation of Exposure
Animals	
Animal urine, proteins and other allergens	Animal handlers in laboratories, research scientists
Grain mite	Farmers, grain-store workers
Prawns, crabs	Seafood processors
Egg protein	Egg producers
Plants	
Grain dust	Grain storage workers
Flour of wheat, rye soy	Bakers, millers
Latex	Health-care workers
Green coffee bean	Coffee roasters
Henna	Hairdressers
Gum acacia	Printers
Enzymes	
Derived/Proteases from Bacillus subtilis	Detergent industry workers
Pancreatin, papain, pepsin	Pharmaceutical industry workers
Fungal amylase	Bakers
Wood dusts or barks	
Western red cedar, iroko, cinnamon, oak, mahogany, African apple, redwood	Sawmill workers, joiners, carpenters
Chemicals	
Diisocyanates	Polyurethane, plastics, varnish workers
Phthalic/acid anhydride	Plastic, epoxy resins, alkyd resins workers
Ethylene diamine/complex amines	Photography, shellac workers, painters
Azodicarbonamide	Plastics, rubber workers
Reactive dyes	Dyeing, textile workers
Methyl methacrylate	Health-care workers
Drugs	
Penicillins, psyllium, methyldopa, cimetidine, salbutamol intermediates	Pharmaceutical, health-care workers
Metals	
Halogenated platinum salts	Platinum-refining workers
Cobalt	Hard-metal grinders
Chromium, nickel	Metal-plating workers
Other	
Oil mists	Tool setters
Metal-working fluids	Machinists
Aluminum potroom emissions	Aluminum-refining workers
Colophony in soft solder flux	Electronics workers

Source: Modified from Venables, 1997.[12]

Exposure types are related to specific job conditions and equipment or materials. The wide variety of worksites and exposures makes development of effective safety measures and education of worksite managers challenging. One exposure present in a variety of worksites is secondhand smoke. State law bans smoking in most workplaces (Chapter 70.94 RCW,

12. Venables KM and Chan-Yeung M. (1997). Occupational Asthma. *The Lancet*, 349:1465-1469.

Washington State Clean Indoor Air Act) but restaurants, bars, casinos, and some other worksites are currently exempted from that ban.

A recent survey of large worksites in Washington found that about 43% of restaurants allow smoking, as well as 11% of warehouses, one in five mixed businesses (including agricultural and industrial facilities), and a small proportion of nursing homes.[13] Worksites such as restaurants, bars, and casinos are of particular interest because the visiting public may be exposed to smoke the same as the workers. Refer to the *Asthma and the Environment* chapter and the *Policy and Advocacy* section of the *Cross-Cutting Issues* chapter for more discussion on smoking.

Workers who develop occupational asthma as a result of a sensitizer in the workplace should be completely removed from the exposure. Even very low levels of sensitizing agents (such as isocyanates) can cause asthma in sensitized individuals. Early diagnosis and exposure cessation can lead to better health outcomes.[14] As exposure cessation often translates to removal from the workplace, an appropriate diagnosis of occupational asthma using objective testing to both diagnose the asthma and to attribute it to the workplace is critical.

For workers with work-aggravated asthma or irritant-induced asthma, steps should be taken to eliminate or reduce the levels of the exposure as much as possible. If substitution of the irritant chemicals for non-irritant chemicals is not possible, the next most effective way to mitigate exposures is through engineering controls to reduce the level of the substance that reaches the worker. An example of an engineering control is the installation of local exhaust ventilation to remove the substance before it enters the work environment. If engineering controls are not available or feasible, then administrative controls, such as changing work patterns or training workers to follow safe work practices should be implemented. Personal protective equipment, including approved respirators and coveralls, should always be the last line of defense and should not be considered primary control methods.

An additional concern involves "take-home" exposures by workers to their families. For instance, one study suggests that children's exposure to pesticides, through the occupational use of pesticides by household members, was associated with asthma and other respiratory disease.[15] Furthermore, workers with home businesses or hobbies involving sensitizing agents, such as some paints, have the potential to be hazards for family members.

Policy Issues

In Washington State, the Department of Labor and Industries (L&I) is responsible for establishing and enforcing workplace safety and health rules through the Washington Industrial Safety and Health Act (WISHA).

While past occupational health research and surveillance activities have helped to identify hundreds of substances currently known to cause occupational asthma, very few of these substances have enforceable workplace exposure limits. This can likely be attributed to a number of factors, including very limited scientific evidence regarding exposure-response relationships; current controversy concerning the existence of thresholds or safe levels of exposure at which sensitizing agents do not induce asthma; and technical limitations in the measurement of the very low exposure levels in which these sensitizing agents may likely initiate asthma.[16]

If future research becomes available regarding exposure-response relationships for specific sensitizing agents, careful consideration should be made at that time regarding the development of scientifically sound exposure limits.

13. Dilley, J., Pizacani, B., Macdonald, S., & Bardin, J. (2005). *The Burden of Asthma in Washington State*. Olympia, WA: Washington State Department of Health. pg:114
14. Lin FJ, Dimich-Ward H, Chan-Yeung M. (1996). Longitudinal Decline in Lung Function in Patients with Occupational Asthma due to Western Red Cedar. *Occupational and Environmental Medicine*. 53:753-756.
15. Salameh PR, Baldi I, Brochard P, Raherison C, Abi Saleh B, Salamon R. (2003). Respiratory symptoms in children and exposure to pesticides. *European Respiratory Journal*, 22:507-512.
16. Cullinan P, Tarlo S, Nemery B. (2003). The Prevention of Occupational Asthma. *European Respiratory Journal*, 22:853-860.

Current Activities

The Safety & Health Assessment & Research for Prevention (SHARP) program at L&I currently maintains a surveillance and prevention program for work-related asthma. Since September of 2000, the SHARP program has been collecting cases of work-related asthma, including occupational asthma and work-aggravated asthma, using both workers' compensation claims data as well as physician reports (work-related asthma is currently a reportable condition under Washington State's notifiable conditions rule). Additionally, since October 2001, SHARP has been conducting case follow-up interviews with workers to collect more detailed information about workers' asthma and associated exposures.

In addition to surveillance system maintenance and data analysis, SHARP's activities have included outreach with employers, employees, and health care providers. These activities have included the development and dissemination of surveillance reports and educational materials, as well as employer site visits, presentations, and various publications.

In addition, individual employers in Washington State may be taking steps to reduce their employees' exposures to chemicals, smoke, fumes, or dusts. For instance, several employers have invited SHARP's industrial hygiene and asthma program staff for worksite visits to assess exposures and provide recommendations for exposure reductions. Further, one Washington employer is currently working with employees to study methods for reducing employee exposure to hexavalent chromium.

The current approach taken by the SHARP program at L&I has been to focus information and prevention activities toward three primary audiences: employers, employees and health care providers.

Outreach to health care providers regarding work-related asthma diagnosis and management is essential since current medical care often lacks the objective medical testing necessary to diagnose asthma and document its relationship to the workplace.[17] Such rigorous objective testing is necessary because a medical history and physical exam lack both the sensitivity and specificity of diagnostic tests for asthma.[18] Improvements in work-related asthma diagnosis and management greatly benefit both the worker and employer, helping to ensure that workers are not inappropriately removed from the workplace and that years of productive work are maintained.

Continued outreach to the health care provider community is warranted until objective testing to diagnose asthma and attribute its cause to the workplace become common practice. Additionally, SHARP's past outreach to physicians and other health care providers have included information on work-related asthma as a reportable health condition in Washington State. To date, these efforts have been resource-intensive and have not resulted in noticeable improvements in reporting rates.[19] Innovative and cost-effective methods to educate health care providers regarding the reporting requirements for work-related asthma; possibly through collaborative efforts with other local and state agencies, organizations, and coalitions; should be explored.

The SHARP program has also focused its outreach efforts more heavily on employers (company owners, safety and health managers, etc.) rather than on employees, because employers are the ultimate decision makers when it comes to deciding whether and how to implement the most effective exposure control strategies. These past efforts, while limited due to a lack of dedicated industrial hygiene support for the work-related asthma program, have been effective in terms of raising awareness and providing recommendations for exposure reduction. Future industrial hygiene visits will strive to follow-up with employers who adopt change to measure the impact of interventions in terms of reduced worker exposures. Of course, this is dependent on employer response and voluntary adoption of prevention strategies.

17. Rosenman KD, Reilly MJ, Kalinowski DJ. (1997). A state-based surveillance system for work-related asthma. *Journal of Occupational and Environmental Medicine*, 39(5):415-425.

18. Malo JL, Ghezzo H, L'Archeveque J, Lagier F, Perrin B, Cartier A. (1991). Is the clinical history a satisfactory means of diagnosing occupational asthma? *The American Review of Respiratory Disease*, 143:528-532.

19. Curwick C, Bonauto D. (2004). Interim Evaluation of Work-Related Asthma Surveillance and Prevention. Technical Report 64-3-2004. Safety & Health Assessment & Research for Prevention (SHARP) Program, Washington State Department of Labor and Industries, Olympia, Washington.

SHARP's current efforts with employees have focused on the dissemination of general educational materials on work-related asthma – its symptoms, causes, diagnosis, and prevention. Future efforts can be targeted to more specific employee groups, providing more detailed information on what employees can do to protect themselves from the specific asthmagens in their workplaces.

More generally, future outreach activities should include collaboration with other state and local agencies, organizations, and coalitions, to appropriately incorporate work-related asthma into existing and future asthma information and prevention activities targeted for the general public (e.g., brochures, health fairs, trainings, etc).

Work-Related Asthma

Goal 1: Reduce work-related asthma in Washington State

Objective WRA.1

Through 2010, increase education of asthmagens and asthma triggers in the workplace among physicians, employers, and employees

Strategies

- Develop and disseminate a continuing medical education monograph for physicians on work-related asthma diagnosis and management, including information on asthma-causing agents and common asthma triggers in the workplace
- Develop/identify and disseminate educational materials for employers on known asthma-causing agents in targeted industries via industry-wide mailings and publication in industry trade journals and newsletters
- Develop/identify and disseminate work-related asthma educational materials to workers, including all individuals reported to the work-related asthma surveillance system
- Collaborate with state agencies and coalitions and other groups conducting outreach to health care providers, employers, and the general public to include information about asthma-causing agents and common asthma triggers in the workplace

Objective WRA.2

Through 2010, decrease worker exposures to asthmagens and common asthma triggers in the workplace

Strategies

- Continue public health surveillance activities for work-related asthma to identify high-risk workplaces, industries, occupations, and exposure sources
- Support and conduct voluntary exposure assessments with select employers identified through surveillance efforts or in targeted industries. Provide site visit reports with findings and recommendations for exposure reduction. Provide technical assistance to employers wishing to adopt workplace changes to reduce exposures and follow-up to document actual exposure reductions
- Monitor the scientific literature for work-related asthma intervention effectiveness studies – consider feasibility of implementation in Washington workplaces

Environmental/Occupational Workgroup Members

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Cross Cutting Issues

Asthma is a complex chronic disease which must have a coordinated and multifaceted approach that is concerned with improving the outcomes in all persons with asthma. This chapter will address cross-cutting asthma issues.

They include:

- Asthma Disparities
- Data & Surveillance
- Policy/Advocacy

Asthma Disparities

The Washington State Asthma Plan focuses on asthma as a public health issue designed to address asthma as a pertinent health issue for all parts of society, regardless of socioeconomic needs or race/ethnicity. However, there are subgroups of the population in Washington State that experience disparities in asthma rates and access to treatment.

Reducing health disparities has been identified as a priority at national and local levels. In 1998, President Clinton established goals for eliminating health status disparities of racial and ethnic minorities by 2010 though the *Racial and Ethnic Health Disparities Initiative*. In 2000, the Centers for Disease Control and Prevention called for the elimination of the disproportionate burden of asthma in minority populations and those living in poverty.[1] At the local level, the Washington State Board of Health and the Department of Health have designated health disparities as a health priority for Washington State.[2,3]

The US Department of Health and Human *Services Healthy People 2010* set national health goals for increasing the quality and years of healthy life and eliminating health disparities. *Healthy People 2010* defines disparities as differences in disease prevalence, access to care or outcomes by gender, socioeconomic position, geographic location, disability status, and/or sexual orientation.[4]

Poverty and education are important determinants of health status and disparities in income and education among sub-groups of the population are reflected in health disparities. An increased understanding of the human genome, leads most scientists to conclude that race as not a valid biological construct. Rather, race and ethnic groups should be viewed as capturing the effects of complex social, cultural, economic and political factors on human health.[5] Studies on health disparities have pointed to a variety of risk factors that are believed to contribute to health disparities. These include:

- poverty
- behavior and lifestyle
- nutrition
- access to health-care services
- genetic predisposition
- education level
- employment
- acculturation
- environmental and occupational exposures
- racism
- gender discrimination.

Other contextual factors (e.g., different levels of insurance coverage and access to high-quality networks of preventive and primary care) play important roles in creating health status disparities.

Health Disparities

Describe the disproportionate burden of disease, disability and death among a particular population or group when compared to the proportion of the population.

-WA State Board of Health

1 US Department of Health and Human Services. (2000) *Action Against Asthma A Strategic Plan for the Department of Health and Human Services*. Pg.34

2 Washington State Board of Health.(2001). *Final Report State Board of Health Priority: Health Disparities*. Olympia, Washington. Pg:11

3 Washington State Department of Health.(2002). *Health of Washington State Executive Summary*. Olympia, Washington. http://www.doh.wa.gov/HWS/ExSum.shtm

4 U.S. Department of Health and Human Services. (2000). *Healthy People 2010: Understanding and Improving Health*. 2nd ed. Washington, DC: U.S. Government Printing Office.

5 Hayes, Maxine. Cover Letter 2004 *Supplemental to the 2002 Health of Washington State*. September 2004

Limitations in Data Collection for Race/Ethnicity Descriptions

Adequately assessing the needs of communities' health status can be challenging. Collecting valid surveillance data on low-income or transient communities is difficult since they may not be reachable for traditional surveys. Barriers may include:

- Some groups are not as accessible to surveys conducted by phone or mail.
- Surveys are not conducted in primary language of audience
- Cultural differences that influence how questions are interpreted or answered may skew results[6]

Data can also be limited by the way respondents are categorized. Race and ethnicity are separated out to capture Hispanic/Latinos who are considered by the Census to be an ethnicity classification and not a race category. Separation of race and ethnicity has caused confusion among Hispanic/Latino survey respondents who are not certain about how they should describe themselves. If there is an "Other" or "Mixed Race" category, many Hispanic/Latinos/Latinos select this category while others may place themselves into the white or American Indian categories.

Confusion over race classifications also occurs in the "Asian/Pacific Islanders" category. Asian Americans and Native Hawaiians/Pacific Islanders may be grouped together or separated into two groups and also may be linked with Native Americans or placed into the "Other Race" category. These data collection issues challenge statisticians when attempting to provide appropriate analysis of these populations. The difficulty of collecting the data or the fractioning of communities of color into small data sets often prevents disparate populations from being clearly articulated in the data utilized to identify health issues and set priorities.

Overall Racial and Ethnic Populations

In the United States the rates of hospital asthma admission for patients of color compared with white patients are 50% higher among adults and up to 150% higher in children. [7] Asthma-related deaths in the United States and Canada are greater in disadvantaged groups such as African American and Hispanic/Latino populations, as well as in those who are poorly educated, live in large cities, or are poor.[8]

Racial and ethnic populations represent 18% of Washington State's total population. This proportion is expected to increase to 25% by 2010.[9] In Washington State, low-income and minority communities have poorer health status than the overall population and have higher rates of a variety of diseases that are known to be associated with environmental triggers, including cancer and asthma. [16]

6 Boysun M, Dilley J. Wynkoop Simmons. K. (2003). *Describing Health Disparities*: an Epi Brown Bag. March 2003 presentation. Washington State Department of Health.

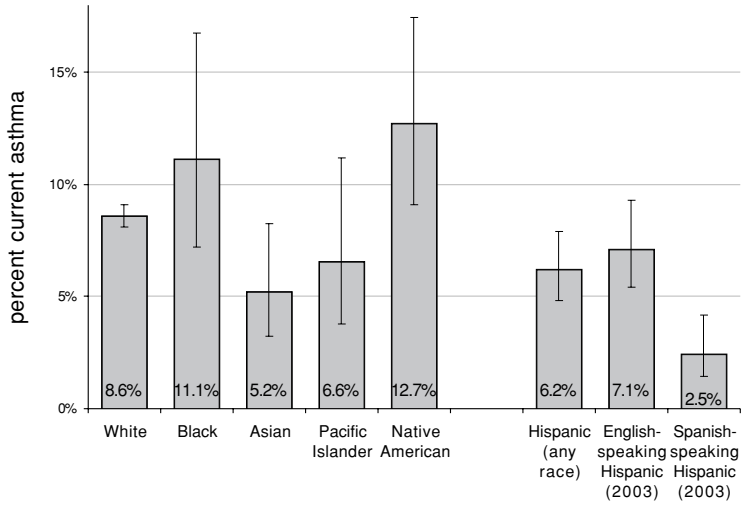
7 Global Initiative on Asthma, National Institutes of Health, National Heart, Lung and Blood Institute (2002). *Global Strategy for Asthma Management and Prevention*.

8 *Ibid*

9 Washington State Board of Health.(2001). *Final Report State Board of Health Priority: Health Disparities*. Olympia, Washington.

16 American Lung Association. *Lung Disease Data in Culturally Diverse Communities, Racial Disparity, Asthma and Asian Americans and Native Hawaiians/Pacific Islanders*. http://www.lungusa.org/site/pp.asp?c=dvLUK9O0E&b=312160

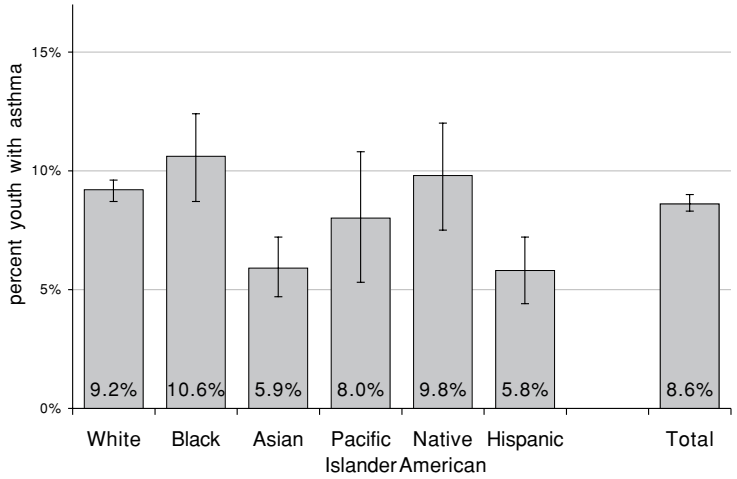
Figure 1: Prevalence of Asthma by Race/ethnicity, Among Washington Adults



Source: 2001-2003 combined Washington State Behavioral Risk Factor Surveillance System (BRFSS). Hispanic/Latino ethnicity collected separately from race. *The Burden of Asthma in Washington State Report.* DOH 2005.

Among school-aged youth, Asians and Hispanic/Latinos were less likely than non-Hispanic/Latinos whites to report having asthma. Differences between non-Hispanic/Latino whites and other racial/ethnic groups were not significant. The Health Youth Survey does not allow for distinction of English from Spanish-speaking Hispanic/Latinos.

Figure 2: Prevalence of Asthma by Race/ethnicity, Among Washington Youth



Source: Combined 2002 and 2004 Washington State Healthy Youth Survey (HYS), 6-8-10-12th grade-standardized. Race and Hispanic/Latino ethnicity collected as part of a single question. *The Burden of Asthma in Washington State Report.* DOH 2005.

Ten years of death certificate data were combined to create meaningful estimates of asthma death rates among race and ethnic groups in Washington State. Age-adjusted death rates for African Americans, Native Americans, and Asian/Pacific Islanders were all higher than for whites, while Hispanic/Latinos were similar to whites.[10]

Although asthma affects Americans of all ages, races, and ethnic groups; low-income and some minority populations experience substantially higher mortality rates, hospital admissions, and emergency department visits due to asthma. Several reports have indicated that observed racial/ethnic disparities are attenuated but do not disappear upon adjustment for socioeconomic factors.[11]

10 Dilley, J., Pizacani, B., Macdonald, S., & Bardin, J. (2005). *The Burden of Asthma in Washington State. Olympia,* WA: Washington State Department of Health. Pg. 47

11 Ibid. pg 45

Without focused attention on disparate populations, efforts to improve asthma outcomes that are directed to the "mainstream" population may fail to reach populations who need them the most and new disparities may be created.

African Americans

Several studies have found that many African Americans living in poverty have access to medical care but are less likely to receive high-quality continuity of their asthma care; asthma education; and inhaled corticosteroid (ICS) therapy.[12] The care of African Americans with asthma has consistently fallen short of many recommendations contained in national guidelines when compared to whites.[13] African Americans are reported to have more severe asthma and are more likely to be hospitalized or die due to their asthma.

In this same study, only about 35% of African Americans reported using inhaled corticosteroids daily (54% for whites) and 42% reported having been provided enough information on how to manage their asthma during an attack (54% for whites). Only 38% reported receiving adequate information about how to avoid asthma triggers (54% for whites) and only 28% had seen an asthma specialist (41% for whites). This study clearly demonstrated that African Americans are not receiving the same level of asthma treatment as their white counterparts.

In 2002, National Health Interview Survey documented that the current asthma prevalence among African Americans was 38% higher than among whites.[14] From 2001 to 2002, asthma prevalence increased 8.5% in African Americans, while it decreased 3.5% in whites. Death rates among African Americans were three times the whites death rates. In 2001, African American women had the highest asthma mortality rate. Hospitalization rates, reported on the National Hospital Discharge Survey, are three times higher for African Americans than for whites.

American Indian/Alaska Native

Nationally, American Indian/Alaska Native (AI/AN) adults have the highest asthma rates among any single-race group; 11.6% of AI/AN compared to the national average of 7.5%. In a recently released report from the CDC, 76% of AI/AN with asthma reported being on asthma medications (compared to an average of 70% nationwide). While AI/AN reported fewer emergency department visits, less loss of sleep and less limited physical activity, more AI/NA adults reported having asthma attacks. In Washington State, Native American children (6-12th grade) were the second highest race group to report asthma (9.7% compared to 9.0 for whites).

Asian/Pacific Islanders

There are limited data available on asthma for Asians or Native Hawaiians/Pacific Islanders. Until recently, national health surveys did not always collect data on these populations. Additionally, small sample sizes are not considered statistically accurate. This is further complicated by the way that Asians are described in the data sources; "Asian Americans" and "Native Hawaiians/Pacific Islanders" may be grouped with "Native Americans" into the category "Other Races."

In states with high Asian or Native Hawaiian populations, such as California and Hawaii, Asians were significantly less likely to have been diagnosed with asthma than any other racial/ethnic population except Hispanic/Latinos. A study conducted in the UK found that, although South Asians had the highest risk of asthma hospital admissions, they had lower frequency of asthma symptoms and were less likely to be clinically diagnosed with asthma than African Americans or whites.[15] This has also been seen in California where an estimated one in eight Asian children (11.7 %) and one in ten Asian adults (9.2 %) had been diagnosed with asthma at some point in their lives. The survey also found that only one in six Asian adults aged 18 and over (16 %) experienced daily or weekly symptoms, compared with 37 % of American Indians and 24 % of whites.[16]

12 George, M. (2005). *Complementary and Alternative Medicine (CAM) and Folk Care in Asthma: Assessment, Education and Integration*. CDC Teleconference Presentation. January 2005 (?)

13 Ortega AN., Gergen PJ., Paltiel AD., Bauchner H., et al. (2002). Impact of site of care, race, and Hispanic ethnicity on medication use for childhood asthma. *Pediatrics*. Jan;109(1):E1

14 Dilley, J., Pizacani, B., Macdonald, S., & Bardin, J. (2005). *The Burden of Asthma in Washington State*. Olympia, WA: Washington State Department of Health. Pg. 48

15 Netuveli G., Hurwitz B., Levy M., Fletcher M., et al. (2005). Ethnic Variations in UK Asthma Frequency, Morbidity, and Health-service Use: A Systematic Review and Meta-analysis. *The Lancet* - Vol. 365, Issue 9456, 22 January 2005, Pages 312-317

16 American Lung Association. *Lung Disease Data in Culturally Diverse Communities, Racial Disparity, Asthma and Asian Americans and Native Hawaiians/Pacific Islanders*. http://www.lungusa.org/site/pp.asp?c=dvLUK9O0E&b=312160

The same California study found that Native Hawaiians/Pacific Islanders tended to have higher asthma rates. Among Native Hawaiians and other Pacific Islanders, approximately one in five children (22 %) and one in five adults (20.8 %) had been diagnosed with asthma at some point in their lives. The 2001 Hawaii Health Survey also reported that Native Hawaiians had a lifetime asthma prevalence rate of 143.2 per 1,000; this was twice the rate of whites or any other population living in Hawaii.[17]

High hospital admission rates among Asian patients may be related to limited use of self-management plans.[18] This may also reflect less patient education and self-management training being offered to these patients.

Hispanic/Latino

Hispanic/Latinos are the fastest-growing minority group in Washington. The 2000 Census indicated that 7.5% of Washington's population is Hispanic/Latino, with that population size projected at greater than 500,000 by 2003. Eleven of Washington's 39 counties have Hispanic/Latino populations greater than 20 %[19]

Much of the information on Hispanic/Latino adults and asthma comes from a phone survey. Hispanic/Latinos who take health surveys in Spanish may be considered "less acculturated" to the mainstream population and exhibit different risk or health behaviors, including some healthier behaviors such as lower rates of cigarette smoking.[20] However, people who do not speak English and who are employed in agriculture may also have increased exposure to irritating chemicals. The migrant farm worker population is also unlikely to be captured in a telephone survey. Therefore, the low rate of asthma reported for this group is potentially an underestimate. Also, less acculturated Hispanic/Latinos are more likely to live in poverty and have less access to health care support for preventive care or clinical control of asthma or other conditions.[21]

However, a recent study of 4,121 Mexican American children who participated in the Third National Health and Nutrition Examination Survey (NHANES III) found that children of Mexican descent who are born in the US are nearly twice as likely to develop asthma as those born in Mexico.[22]

In Washington, keeping in mind the limited data reported, asthma prevalence among both Hispanic/Latino youth and adults is significantly lower overall than non-Hispanic/Latino whites. However, when adults were sorted by language (as a measure of acculturation) there was no difference in rates of asthma between English-speaking Hispanic/Latinos and non-Hispanic/Latinos. It has been reported that there is substantial variation in asthma prevalence between Hispanic/Latino sub-groups, with Puerto Ricans reporting the highest prevalence.[23] Washington's Hispanic/Latino population originates predominantly from Mexico.

Community clinics in the Yakima Valley area (Central Washington's agricultural community), have reported an increase in the number of children they are seeing with asthma. This has greatly impacted clinic services and resources.[24] In addition, a partnership of organizations including the University of Washington, Heritage University, the Yakima Valley Farm Workers Clinic and the Northwest Community Education Center/Radio KDNA are conducting a community-based participatory research project. *El Proyecto Bienestar*, which focuses on the identification and prioritization of occupational and environmental issues facing Hispanic/Latino agricultural workers and their families in the Yakima Valley. As part of this project, during the summer of 2004, a community services poll was conducted yielding 202 useable surveys. One question asked respondents to identify environmental health concerns. "Asthma in children" received the most responses of "definitely a concern," at a rate of 71.8%. This concern was followed by surface water pollution (66.7%), ground water pollution (63.2%), soil contamination (64.2%), and food illnesses (64.2%). In the next two years, *El Proyecto Bienestar* plans to analyze this 2004 survey along with a 2005 community survey and key informant

17 American Lung Association. *Lung Disease Data in Culturally Diverse Communities, Racial Disparity, Asthma and Asian Americans and Native Hawaiians/Pacific Islanders*. http://www.lungusa.org/site/pp.asp?c=dvLUK9O0E&b=312160

18 Partridge. MR. (2000). In What Way May Race, Ethnicity or Culture Influence Asthma Outcomes? *Thorax*.55:175-176

19 Washington State Office of Finance Management. *Census 2000 and 2003 Intercensal Estimate Updates*. Accessed May 2, 2005. http://www.ofm.wa.gov/news/release/2004/093004.htm

20 Perez-Stable EJ, Ramirez A, Villareal R, Talavera GA et al. (2001). Cigarette Smoking Behavior Among US Latino Men and Women from Different Countries of Origin. *Am J Public Health*. 91:1424-30.

21 Centers for Disease Control and Prevention, Office of Minority Health. *Hispanic/Latino or Latino Populations Data Overview*. Accessed on June 15, 2005. http://www.cdc.gov/omh/Populations/HL/hl.htm

22 Eldeirawi K, McConnell R, Freels S, Persky VW.(2005). Associations of Place of Birth with Asthma and Wheezing in Mexican American Children. *J Allergy Clin Immunol*. Jul;116(1): 42-8

23 Perez-Perdomo R, Perez-Cardona C, Disdier-Flores O, Cintron Y. (2003). Prevalence and Correlates of Asthma in the Puerto Rican Population: Behavioral Risk Factor Surveillance System, 2000. *J Asthma* 40:465-74.

24 Personal communications with Vickie Ybarra and John Thayer, Yakima Valley Farm Workers Clinic. 2005

interviews in order to best identify and prioritize environmental and occupational issues of concern in the Yakima Valley."[25]

If the rate of childhood asthma among Hispanic/Latinos in Washington State is increasing, the increase could be masked by the fact that the primary data sources for prevalence by race/ethnicity are currently from adults (BRFSS) and youth 6th grade and older (Healthy Youth Survey). The proportion of Hispanics under the age of 18 in the United States (33.0%) is significantly greater than among non-Hispanics (22.6%). Given the limited asthma surveillance available among children, an increase in childhood asthma among the Latino/Hispanic population of Washington might not be detected immediately.

Special effort must be taken to collect accurate asthma data from Hispanic/Latinos within Washington State. Many Hispanic/Latinos speak only Spanish, do not maintain regular phone service and are not comfortable in a phone survey. BRFSS may be an inadequate tool for collecting data among this population.

Socioeconomics

The causes of asthma and access to treatment/clinical outcomes can be linked to socioeconomic factors.[26] Many studies on racial/ethnic disparities in asthma have made an attempt to examine factors related to race/ethnicity that might account for differences in asthma rates. A study utilizing the National Health and Nutrition Examination Study, found that low-income was the strongest independent predictor of asthma, and that the African American-white occurrence difference was largely explained by income disparity.[27] In another study that examined urban residences found that, after controlling for various factors, all urban children, regardless of race or income, were at increased risk for asthma.[28] Research has shown a pattern of increased use of emergency rooms, and less use of primary care provider for asthma attacks with primary health care practitioners in urban, low-income families.[29]

These and other studies have pointed out that racial disparities in asthma rates, occurrence and deaths are possibility related to the following factors:

- Increased exposure to air pollution (from inner-city residence)
- Lack of access to health care
- Higher smoking rates and exposure to secondhand smoke (both prenatally and postnatally)
- Racial or ethnic differences in health beliefs regarding preventive medications
- Overcrowding that may result in greater exposure to irritants such as cockroach allergens[30]

Racial/ethnic disparities do not disappear upon adjustment for socioeconomic factors. In general, the difficulties inherent in definitions of race and ethnicity are thought to be responsible. Authors have also mentioned that adjusting for income or education disparities may not be sufficient to explain existing social and environmental inequalities. [31]

Asthma as a Disability

Asthma, if severe enough, can be a disability that affects a person's ability to work/attend school. Missed days of work for the person with asthma or for a parent caring for a child with severe asthma may also have a financial impact. This can be amplified if the family has limited/no health care or has multiple children with asthma.

Asthma has also been found to be twice as high among people who already have a disability than among those who are free from disability.[32] A study conducted in the UK found that families with more than one disabled child are: more likely to be single parents; less likely to be employed; more likely to be in semi-skilled or unskilled manual jobs; more likely to be

25 Cardenas N, Guzman M, Valencia M, Keifer. (2004). *An Initial Investigation of Environmental and Occupational Health Concerns Among Yakima Valley Residents by ConneX Students*. Presented at the Western Migrant Stream Forum in San Diego, CA in 2005 and the Pacific Northwest Agricultural Safety and Health Center conference on Sustainable Agriculture in Hood River Oregon, 2004

26 Global Initiative on Asthma. National Institutes of Health, National Heart, Lung and Blood Institute (2002). *Global Strategy for Asthma Management and Prevention*. Pg. 20

27 Dilley, J., Pizacani, B., Macdonald, S., & Bardin, J. (2005). *The Burden of Asthma in Washington State*. Olympia, WA: Washington State Department of Health. Pg.109

28 Ibid. pg: 109

29 Shapiro GG. Stout JW, (2002). Childhood Asthma in the United States: Urban Issues. *Pediatr Pulmonol*. 2002 Jan;33(1):47-55

30 Dilley, J., Pizacani, B., Macdonald, S., & Bardin, J. (2005). *The Burden of Asthma in Washington State*. Olympia, WA: Washington State Department of Health. Pg. 109

31 Ibid. pg: 109

32 Canadian Community Health Survey. (2004). *CCSD's Disability Information Sheet: Number 14, 2004*. http://www.ccsd.ca/drip/research/drip14/

dependent on income support; and less likely to own their own home.[33] Another study found that single mothers with a child disabled by asthma lose an average of 255 desired annual working hours a year.

Sexual Orientation

In adult telephone surveys, Washington residents are asked about their sexual orientation. Gay men and lesbian women were combined for comparison to heterosexual (straight) people, both including and excluding bisexuals. The rate of asthma was significantly greater among people who self-identified as gay or lesbian. This may be the result of higher rates of cigarette smoking among this population.[34] Another consideration could be lack of access to medical care. Since medical insurance coverage may not be available to a same-sex domestic partner, lack of medical insurance may be a greater problem than for the general population, as a whole.

Environmental Factors

Environmental exposures play an important role in the development and management of asthma. The main factors responsible for triggering asthma attacks and persistent symptoms are exposure to allergens, irritants and viral respiratory infections (also called triggers). Common biological agents are allergens, or substances that can cause an allergic reaction such as animal dander, dust mites, cockroaches, and molds. Common respiratory irritants include diesel exhaust, fumes from household and industrial cleaning products, solvents, new building and finishing materials, secondhand smoke and air pollution, including ozone and fine particles.

Increased exposures to environmental hazards can increase a person's risk of getting asthma or of making asthma worse. Environmental exposures are considered to be disproportional when a community has greater numbers of industrial and/or waste facilities. Concentrations of toxic and other triggering substances from each facility, coupled with the increased number of facilities, raise the communities' overall exposure to environmental hazards.[35] The Environmental Protection Agency (EPA) has been a supporter of environmental justice, a movement that addresses such disparities. Factors such as poor nutrition and stress can make people within a community more susceptible to adverse health effects of environmental hazards and less able to manage them.[36]

In several of South Seattle's neighborhoods, industrial facilities are located adjacent to residential housing and South Seattle communities experience higher death rates and decreased life expectancies than the Seattle areas.[16]

Poverty and lack of access to health care increases the risk of asthma. Children in central and southeast Seattle have the highest incidence of asthma in King County, with hospitalization rates that far exceed any other area in the county. In King County, there are about 9,500 children with asthma living in households with incomes less than 200% of the federal poverty level. According to data from the Seattle-King County Healthy Homes Study, it is estimated that close to 40% (3,800) of these homes have at least one smoker.[17]

Environmental justice issues are not only found in urban areas. Rural areas within Washington State also face issues related to chemical utilized in fertilization, pesticides, or smoke from agricultural burning.

Secondhand Smoke

Although asthma can affect any one at any age, there are factors that put people at risk of getting or worsening their asthma. These factors include genetics and level of exposure t such as personal behaviors as smoking. Tobacco smoke is a well-documented potent trigger for asthma. *The Burden of Asthma in Washington State* report found that, even though there is conflicting evidence as to whether active smoking is a risk factor for asthma, researchers agree that smokers with asthma have more severe symptoms than people with asthma who do not smoke.

Environmental Justice

The fair treatment of all people regardless of race, color, national origin, or income with respect to the development, implementation, and enforcement of environmental laws, regulations and policies.

-EPA

16 American Lung Association. *Lung Disease Data in Culturally Diverse Communities, Racial Disparity, Asthma and Asian Americans and Native Hawaiians/Pacific Islanders*. http://www.lungusa.org/site/pp.asp?c=dvLUK9O0E&b=312160

17 Ibid.

33 Joseph Rowntree Foundation. (1998). *The Number and Characteristics of Families with More than One Disabled Child*. 1998 - Ref 218 http://www.jrf.org.uk/knowledge/findings/socialcare/SCR218.asp

34 Dilley, J., Pizacani, B., Macdonald, S., & Bardin, J. (2005). *The Burden of Asthma in Washington State.* Olympia, WA: Washington State Department of Health. Pg.51

36 Institute of Medicine. C*learing the Air: Asthma and Indoor Air Exposures.* Washington, DC: National Academy Press, 2000. pg 6

Complementary and Alternative Medicine

A group of diverse medical and health care systems, practices, and products that are not presently considered to be part of conventional medicine

In Washington, current smokers (people who smoke every day or just on some days, combined) had the highest prevalence of asthma, former smokers somewhat less, and never-smokers had the lowest prevalence of current asthma.[37] Among Washington middle-school-aged youth, current smoking is strongly associated with asthma, but the association is not significant for high school-aged youth.[38]

Exposure to secondhand smoke exacerbates asthma in a number of ways. Studies have shown that children with asthma exposed to secondhand smoke have more frequent need for emergency services, a greater need for medications, and a more difficult time recovering from an acute asthmatic episode.[39]

Tobacco use among people with low-incomes or members of minority racial/ethnic populations is significantly higher than among the general population. In Washington State in 2005, smoking rates were as follows:

The 2005 State Smoking Rate	19.8%
African Americans	28%
Asians and Pacific Islanders	18%
Native Americans	41%
Hispanic/Latino	16%

Complementary and Alternative Medicines

The World Health Organization estimates that four billion people use complementary and alternative medicine (CAM) and that as much of 80% of the world's heath care is CAM-based.[40] The utilization of CAM among patients with asthma is very popular ranging from 41% to 59%.[41]

CAM is being utilized in cultures all over the world, and many of the asthma medications currently in use originated from herbal remedies found in alternative medicine practices. Folk medicine or traditional medicines can include: herb-based remedies (teas), over-the-counter drugs, breathing techniques, acupuncture, chiropractic care, and prayer, and among other things.

In African American communities, home remedies have served as the foundation of health care and have served as cost-effective alternatives to "Western" medicine.[42] Some cultures may turn to CAM due to disenfranchisement from medical services due to racism. Others may utilize CAM to increase effectiveness of "Western" medical care.

Cultural differences can also play a role in how communities utilize Western medicine. One study recently conducted among the Navajos found that dependency on Western medications was not a desired cultural norm. Therefore, persons with asthma were constantly being "weaned" from their asthma medications including their long-term controllers. The preference was to rely on the hospital emergency room to provide one dose medications when symptoms arose.[43]

To provide optimal asthma care, it is important to understand what types of CAM are being utilized by different communities and why.

Policy Issues

The *Standards of Public Health in Washington State* states that, "health policy decisions (should be) guided by health assessment information, with involvement of representative community members."[44] It is critical that representatives from communities with asthma health disparities be involved in asthma planning and implementation.

In 1998, the Washington Asthma Initiative identified health disparities issues and recommended that communication barriers due to language and cultural differences be minimized through translation of education materials into a variety of languages and integrating cultural awareness into continuing education curricula for health care providers.[45]

37 Dilley, J., Pizacani, B., Macdonald, S., & Bardin, J. (2005). *The Burden of Asthma in Washington State*. Olympia, WA: Washington State Department of Health. Pg. Pg 56.

38 Ibid. Pg: 57

39 Ibid. Pg: 92

40 George, M. (2005). *Complementary and Alternative Medicine (CAM) and Folk Care in Asthma: Assessment, Education and Integration*. CDC Teleconference.

41 Brutsche MH. (2002). Complementary and Alternative Medicine in Asthma – Safety, Effectiveness and Costs. *Swiss Med Wkly*.132: 329–331.

42 George, M. (2005). *Complementary and Alternative Medicine (CAM) and Folk Care in Asthma: Assessment, Education and Integration.* CDC Teleconference.

43 Wright AL. *Perceptions of Asthma among Native Americans and Alaska Natives*. http://www.resp-sci.arizona.edu/research/asthma/native-american-asthma.htm

44 Washington State Department of Health. *Washington State Standard for Public Health*. www.doh.wa.gov/standards page6

45 American Lung Association of Washington. (1998). *Washington State Asthma Project*. Pg: 63

Asthma is a serious health risk for those who currently have asthma and for those potentially exposed to asthma-causing agents. Illness, hospitalization, and death related to asthma are disproportionately high for minority communities. This makes asthma not only a serious health issue, but also an issue of social justice.[46]

Health Disparities

Goal 1: Reduce health disparities related to asthma in Washington State

Objective HD.1

Through 2010, minimize communication barriers due to language and cultural differences though translation of education materials into a variety of languages and culturally appropriate outreach strategies

Strategies

- Integrate cultural awareness into continuing education curricula for health care providers
- Increase education on complementary and alternative medicines and cultural diversity into the Asthma Educator Institute
- Explore funding resources to provide mono-lingual or bi-lingual services for people with asthma

Objective HD.2

Through 2010, increase the Washington Asthma Initiative's knowledge of the needs of health disparate communities

Strategies

- Conduct a needs assessment for underserved and disparate communities in Washington State
- Utilize tribal and other diverse community experiences to make quality improvement recommendations to similar other groups working on improving asthma care
- Expand WAI membership to include representatives of disparate communities through active recruitment
- Coordinate with local and statewide partners who are working with disparate communities on asthma/asthma-related issues
- Explore environmental justice issues for families working in or near the poverty level
- Support polices that help address asthma among disparate populations

Objective HD.3

Through 2010, increase data sources that capture race/ethnic data in Washington State

Strategies

- Recommend that Comprehensive Hospital Abstract Reporting System (CHARS) capture race/ethnicity data
- Explore methods to increase data sources for younger children
- Explore over-sampling communities of color in Behavior Risk Factor Surveillance Survey (BRFSS) and other public health surveys.

46 Children's Environmental Health Network. (2004). *Asthma Fact Sheet*. August 8. http://www.cehn.org/cehn/asthmafactsheet.html.

Data & Surveillance

Surveillance is the ongoing systematic collection, analysis, interpretation and timely dissemination of health data. The purpose of a surveillance system is to monitor trends in disease and its management in order to prevent or better control it within the population. Asthma surveillance is a critical component of public health efforts to address asthma in Washington State.

- Asthma is a high-priority. It is a frequent cause of emergency department (ED) visits and hospitalizations making it a very costly disease.
- Asthma surveillance is useful in targeting and evaluating efforts to improve asthma.
- Although costly, surveillance is needed at the national, state, and local levels. Comparison of local disease rate estimates with other local, state and national estimates is essential to providing measurements of progress in programs aimed at reducing the incidence of asthma attacks.
- Even limited data can be used to guide asthma control improvements.[47]

Washington State is fortunate to have an established public health surveillance system, as well as strong epidemiologic capacity within chronic disease prevention programs at state agencies, universities, and health care organizations. 'Data and surveillance' activities for the Washington State Asthma Plan will build upon this capacity for continued or enhanced asthma surveillance, assessment and evaluation in support of the state plan, as well as public education about the burden of asthma.

Current Activities

The Washington Asthma Initiative has a standing committee on data and surveillance whose formal charge is to: *Improve our understanding and information on asthma and its impact on children and adults living in Washington State and to provide recommendations regarding collection of asthma data in Washington*.

The committee is comprised of stakeholders from all over the state who have come together to review data sources and to assist state staff in the development of *The Burden of Asthma in Washington State* report that was finalized in June 2005. For more detailed information on asthma data and surveillance, refer to *The Burden of Asthma in Washington State* report available from the Washington State Department of Health.

47 Center for Disease Control and Prevention. *National Asthma Training Curriculum*. CD-ROM 2005

Data and Surveillance

Goal 1: Analyze public health surveillance data and describe asthma prevalence and impact within the Washington State population

Objective DS 1.1

Through 2010, conduct descriptive epidemiologic analyses to characterize the distribution of asthma prevalence, morbidity, and mortality in Washington State

Strategies

- Use the Behavioral Risk Factor Surveillance System (BRFSS) and the Healthy Youth Survey (HYS) to describe prevalence of asthma
- Use hospitalization data from the Comprehensive Hospital Abstract Reporting System (CHARS) to describe hospitalization rates for asthma
- Use the 2003 National Survey of Children's Health to further describe the burden of asthma among children in Washington State

- Use standard case definitions for asthma-related variables
- Compare Washington State data to national data sources to identify any deviations in Washington from secular trends

Goal 2: Support planning and evaluation of goals and objectives within the Washington State Asthma Plan

Objective DS 2.1

Through 2010, develop a data collection plan that reflects the priorities within the State Asthma Plan and provides data at timely intervals for objective program development or objective evaluation

Strategies

- Identify supplemental asthma questions to be proposed for the Washington BRFSS each year for the period of the State Plan
- Identify supplemental asthma questions to be proposed for the biennial Washington HYS during the period of the State Plan
- Partner with other chronic disease program assessment teams who plan to collect data so that they will include asthma-related measures within organizational and environmental assessments, including surveys of worksite, school, and health care practices and policies
- Partner with organizations that already collect data relevant to asthma to conduct additional analyses or obtain those data in a format that will be useful to the State Asthma Plan stakeholders, including the Department of Labor and Industries Worker Compensation claims data, the Office of the Superintendent of Public Instruction School Nurse Corps data, Medicaid utilization data collected by the Department of Social and Health Services, Washington State University Tools for Schools assessment data, and Department of Ecology air monitoring data
- As new opportunities are identified, maintain flexibility to take advantage of additional data sources (although implications should be considered if resources for maintaining existing data collection/analysis would be diminished)

Objective DS 2.2

Through 2010, identify existing resources, opportunities and models that may fill data gaps identified by data and surveillance stakeholders in the State Plan process

Strategies

- Explore possibilities for models to collect Emergency Room utilization data, including potential for asthma reporting from the new emergency room Bioterrorism Reporting System implemented through local health departments, hospitals, and the Department of Health
- Explore existing models and emerging technologies for describing health care quality for people with asthma through shared medical and pharmaceutical utilization data ('data warehousing') and clinical service delivery tracking ('collaboratives')
- Maintain participation in national data-related groups, monitoring of published literature, and attendance at national conferences to identify emerging opportunities or models for data collection, management, or analysis

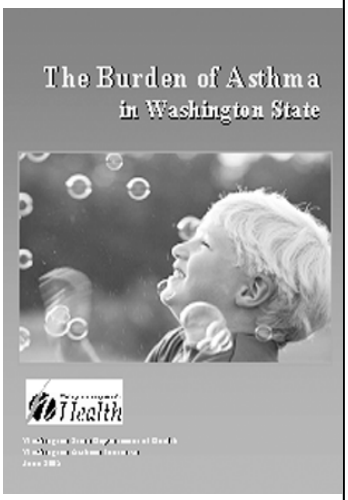
Goal 3: Share data with stakeholders on a routine basis, in easily accessible and understandable formats, to support communication about the importance of addressing asthma as a priority in public health

Objective DS 3.1

Through 2010, disseminate (up to 4 times per year) new data findings through short reports in a newsletter

Strategies

- Summarize findings from surveillance systems or targeted assessments as they become available
- Focus topically using the framework of the Washington State Asthma plan (e.g. schools, community, health care) for presentation of assessment or evaluation findings
- Assure that reports are available electronically and catalogued on a publicly available website
- Develop data exchange mechanisms between private and public stakeholders on collected asthma data



Objective DS 3.2

Through 2010, disseminate an updated "Washington State Asthma Burden Report"

Strategies

- Summarize findings from surveillance systems or assessments collected during the time period
- Discuss efforts of the Washington State Asthma Plan, and if possible describe how or if any outcomes might be attributed to the activities of that plan

Objective DS 3.3

Through 2010, continue to meet with asthma stakeholders to identify key questions and priorities to include when planning data collection and analyses

Strategies

- Continue to support the 'data and surveillance' committee as part of the Washington Asthma Initiative
- Provide presentations for or participate in state and regional meetings of asthma stakeholder groups
- Plan for inclusive stakeholder feedback in development and review of major reports or publications that describe asthma in Washington

Policy/Advocacy

Reducing the burden of many chronic diseases may be aided by policy or legislative changes. Behaviors have been changed and lives have been saved as a result of such action. Well-known examples include:

- Inhaler laws allowing students to carry medications at school,
- Leaf burning laws,
- Environmental tobacco smoke laws, and
- Emissions laws for cars, bus retrofitting and coal-burning industries.[48]

48 Center for Disease Control and Prevention. *National Asthma Training Curriculum*. CD-ROM 2005

Not all policies require legislative change. Some of the most important policies affecting health are developed at the local level and in private sector organizations. For example, a community youth program's policy can require utilization of smoke-free venues for all sponsored youth field trips or a business can install ventilation and establish a regular maintenance schedule to reduce airborne allergens.

In 2001, a RAND Health expert panel identified six policy goals in addressing asthma. They are:

1. Improve access to and quality of asthma health care services
2. Improve asthma awareness among affected individuals and the general public
3. Ensure asthma-friendly schools
4. Promote asthma-safe home environments
5. Encourage innovative asthma prevention and management
6. Reduce socioeconomic disparities in child asthma outcomes[49]

The National Conference of State Legislatures (NCSL), a bipartisan national forum for state lawmakers, concludes that government agencies' public health authority can be used to reduce asthma impacts. Government agencies may regulate environmental factors that contribute to triggering asthma attacks and may adopt environmental laws to combat conditions that lead to asthma and other respiratory health issues. States are better positioned to adopt prevention strategies to meet local needs and can experiment with solutions to complex health problems more easily than the federal government.[50]

NCSL reports that since 2000, there have been 220 asthma-related bills introduced in state and federal legislatures, of which 79 have been enacted. These bills range from permitting children to bring asthma rescue medicines to school to establishing smoking bans in public places.

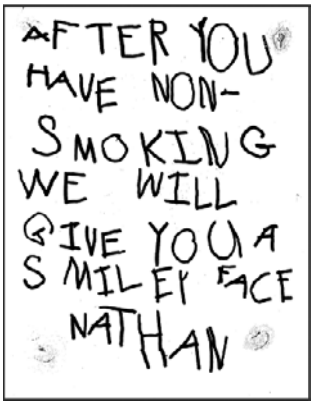
The number of bills introduced shows the heightened level of interest in asthma by state legislators. By way of comparison to other environmental health concerns, 277 bills related to indoor air quality, 102 bills related to mercury, 213 related to lead poisoning, and 102 related to asbestos were introduced in the same time period. Children's environmental health was addressed in 56 bills.

In 2004, Congress passed the *Asthmatic Schoolchildren's Treatment and Health Management Act of 2004*, which gives funding preference to states that protect students' rights to carry and self-administer lifesaving asthma and/or anaphylaxis medication

In 2005, the Washington Asthma Initiative drafted a comprehensive bill for asthma called the "*Attack Asthma Bill", an act relating to the prevention, diagnosis, and treatment of asthma.* This bill addressed building codes, insurance coverage, school children's access to asthma and anaphylaxis rescue medications, and data surveillance. Although many provisions of the original bill were not included in the final version, the enacted law requires school districts to adopt asthma policies and the state government health purchasing policy to be coordinated to assure that best practices in asthma treatment and prevention are being followed. The new law states "…all elementary and secondary schools must authorize any student to self-administer medication to treat his or her asthma or anaphylaxis where: (1) a health care practitioner has prescribed the medication and formulated a written treatment plan; (2) the student has demonstrated the skill level necessary to use the medication; and (3) the student's parents have completed any written documentation required by the school. The authorization must be renewed each school year."

49 RAND Health. (2001). *Improving Childhood Asthma Outcomes in the United States: A Blue Print for Policy Action*. Pg: xvii

50 The National Conference of State Legislatures. http://www.ncsl.org/programs/environ/envhealth/asthma2.htm 2002.



7-year old Nathan, a child with asthma writes to a restaurant owner.

(Reprinted with permission)

Plan Implementation

Policy interventions that will help implement the goals of the Asthma Plan will require existing and future partners to coordinate efforts to identify promising opportunities at all levels of government and within the private sector to improve asthma care. An initial policy intervention plan will be adopted by the Washington Asthma Initiative and updated annually. This plan will be based on the goals and strategies discussed below and will identify specific actions to be taken in the upcoming planning period. In each case desirable policy outcomes will be stated, relevant policy decision-makers targeted and tactics described. The policy intervention plan will address asthma related issues in at least the following general areas: environmental, tobacco smoke, schools, health care and the workplace.

Environmental Policies

Establishing a clear link between a particular instance of an environmental exposure and the manifestation or complication of disease is difficult due to the fact that there may be many confounding variables interacting to produce health outcomes.[51] This makes identification of specific asthma related environmental issues difficult and, therefore, policy solutions less compelling than where a clear threat to health is isolated.

In Washington State environmental policies have been effective in improving the overall quality of air, as demonstrated in the chart below. In Washington State, air quality programs are housed at The Department of Ecology, the Department of Health and through seven regional Air Quality Agencies.

In September 2003, the governors of the three West Coast states committed to a regional greenhouse gas reduction initiative. As an initial step, the governors' staffs were directed to develop joint policy recommendations on five reduction strategies that will benefit from regional cooperation and action: hybrid vehicle procurement, reduced ports and highway diesel emissions, renewable energy, energy efficiency, and measurement and reporting.[52]

In 2004, Governor Gary Locke directed all state government agencies to purchase only low emission vehicles for state travel. The executive order also directed all diesel-powered public transportation to convert to 2% biodiesel in an extended effort to reduce vehicle emission and diesel exhaust. Washington now grants tax deferrals and exemptions for biodiesel fuel production and sales.

In July 2005, all new and remodeled buildings are required to use green building alternatives. Washington State schools may use the Washington Sustainable Schools Protocol which includes incentives for schools to build high performance schools through green building practices. Also the state of Washington will begin implementing California vehicle emissions standards and require landlords to notify tenants of possible health effects of mold in residential units.

Secondhand Smoke

In November 2005, Washington voters passed an initiative vote which prohibited smoking in all public places and within 25 feet from entrances, exits, opening windows and ventilation intakes, including restaurants, bars, hotels, retail tobacco stores, sports arenas, skating rinks, bowling alleys, casinos, gymnasiums and health spas.

51 Washington State Board of Health.(2001). *Final Report State Board of Health Priority: Health Disparities*. Olympia, Washington.

52 Governor Gary Locke. *Combating Global Warming.* Accessed on March 4, 2004: http://www.digitalarchives.wa.gov/governorlocke/globalwarming/globalwarming2.htm

In addition to the Clean Indoor Air Act there are four other laws and an executive order prohibiting smoking in Washington State. Enforcement agencies vary for each of the laws.

Venues	Enforcement Agencies
Office work environments	Labor and Industries
Child care, foster, residential and group homes	DSHS
Restaurants	Local Health Department
All other establishments in the Clean Indoor Air Act	Local Fire Department
State Ferries	Department of Transportation

Many of the establishments listed in the Clean Indoor Air Act are regulated by the local fire departments. Smoking enforcement can vary depending on the availability of fire fighters' time.

Health care

Strategies to tackle asthma must address an array of issues. Leadership is needed at the local, state and national levels. Several of the issues, such as access to medical care and health payers coverage of chronic disease education and management, faced by people with asthma are rooting in the health care system as a whole. Below are some policy issues that are critical to addressing asthma in Washington State.

- People with asthma should have access to care by health care practitioners and specialists with appropriate expertise throughout Washington State - rural and urban, regardless of insurance status, racial/ethnic background or place of residence.
- The use of evidence-based asthma management national and state guidelines throughout health care organizations and practices will be the standard of care.
- Policies will support utilization of the planned care model for systems change and promote use of integrated comprehensive electronic medical records and registries that are designed to track patient clinical status and outcomes.
- A system that rewards health care practitioners and health care delivery systems for providing high quality care that follows national and state guidelines needs to be established.

Schools

The provisions of the recently passed *Attack Asthma Bill* need to be implemented by all school districts. Local policies that require an asthma action plan and medical/treatment orders for every student with asthma should be in place and enforced. This will require a coordinated effort between the health care provider, the parent/guardian and the schools. Currently, policies that coordinate emergency treatment plans for persons with asthma are inconsistent throughout Washington's schools system.

Work-related Asthma

In Washington State, the Department of Labor and Industries (L&I) is responsible for establishing and enforcing workplace safety and health rules through the Washington Industrial Safety and Health Act (WISHA). While past occupational health research and surveillance activities have helped to identify hundreds of substances currently known to cause occupational asthma, very few of these substances have enforceable workplace exposure limits. This can likely be attributed to a number of factors, including very limited scientific evidence regarding exposure-response relationships; current controversy concerning the existence of thresholds or safe levels of exposure at which sensitizing agents do not induce asthma; as well as technical limitations in the measurement of the very low exposure levels in which these sensitizing agents may likely initiate asthma.[53]

53 Salameh PR, Baldi I, Brochard P, Raherison C, et al. (2003). Respiratory Symptoms in Children and Exposure to Pesticides. *European Respiratory Journal*, 22:507-512.

Policy and Advocacy

Goal 1: Advocate and support polices that improve the quality of life for persons with asthma in Washington State

Objective PA.1

Through 2010, support smoke-free policies in Washington State

Strategies

- Promote expansion of Washington Clean Indoor Act to include restaurants, bowling alleys, skating rinks and other indoor places
- Team with other state and local partners to provide education and advocate for smoke-free policy changes
- Identify community organizations (e.g., youth camps, youth sports, faith-based) that do not have or do not utilize smoke-free venues, especially if children are involved
- Support improved air quality monitoring and data management systems

Objective PA.2

Through 2010, promote requirements for construction and maintenance of public buildings (including school buildings and state and local offices) that promote clean indoor air and prevent "sick buildings"

Strategies

- Support local, agency policies that promote clean indoor air in public buildings (e.g., reduced idling in front of ventilation system intake)
- Support legislation requiring standards for building construction, maintenance procedures, and heating and ventilation systems, to minimize the presence of common asthma triggers in public and private buildings
- Support policies promoting clean air by decreasing motor vehicle emissions

Objective PA.3

Through 2010, support policies that promote clean outdoor air in Washington State

Strategies

- Support policies that include clean diesel technology, low emission vehicles, zero emission vehicles and use of natural gas, electric, and hybrid vehicles, including public vehicle fleets
- Promote use of transportation policies, regulations, and funding that maximize air quality improvements and the impact on health, including best practices for reduction or mitigation of diesel and particulates, such as using clean diesel technology for construction vehicles and other vehicles involved in transportation projects
- Assess current policies and laws around air quality regulations and identify needed policy

Objective PA.4

Through 2010, increase the number of school-based asthma/asthma-related policies

Strategies

- Support statewide implementation of school-related provisions of the 2005 Attack Asthma Bill.

- Support policies allowing students with asthma to self-carry and self-administer asthma medications including asthma action plans
- Develop a model policy requiring schools to conduct yearly environmental assessments to reduce asthma triggers in the school-based setting
- Support policies which require utilization of integrated pest management (IPM) techniques to control pests in the schools[54]
- Support school-based science lab policies that reduce chemicals in the classroom
- Increase number of patients with appropriate asthma-related insurance coverage
- Ensure affordable access to quality care for all individuals with asthma
- Partner with schools to design and implement facility and grounds maintenance polices and protocols that promote a healthy school environment
- Support policy changes necessary to guarantee portability of student health records, attendance records and asthma action plans with the student when the student changes schools

Objective PA.5

Through 2010, support local asthma coalitions in policy advocacy in their local communities

Strategies

- Support training and educational materials to asthma coalitions on policy and organizational practice change at the local level

Objective PA.6

Through 2010, support policies to promote access to appropriate health care

Strategies

- Encourage health plans to include payment for asthma education
- Encourage the development of asthma registries

Data and Surveillance Workgroup

Workgroup Chairs:

Rick MacCornack, Ph.D.	Northwest Physicians Network, Director of Quality Improvement Northwest Physicians Health Improvement Foundation, Program Director
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Policy and Advocacy Workgroup

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Holly Tull, RRT, AE-C	Yakima Valley Memorial Hospital, Respiratory Therapist Yakima Area Asthma Coalition, Chairman

Development of the State Plan, Work Plan Development, Implementation and Evaluation

A plan is effective only if it is implemented. It is likely that funding sources will initially provide resources for some, but not all, of the activities outlined in the State Plan. Improving the quality of life for persons with asthma in Washington State will require an ongoing effort to form public and private partnerships to address asthma issues at both the state and local levels.

You'll never plough a field by turning it over in your mind.

-Irish Proverb

Development of the Washington State Asthma Plan

Initiated and given staff support by the American Lung Association of Washington. The Washington Asthma Initiative (WAI) has been a leader in forming recommendations and coordinating health care providers from varied backgrounds to work towards improving the prevention, diagnosis and management of asthma in Washington State. The Washington State Department of Health and key stakeholders from around the state have joined with the WAI in the development of a statewide asthma plan.

On September 1st, 2004 at the *Asthma Plan Kick-off meeting*, more than 100 diverse stakeholders and individuals met to start the development of the Washington State Asthma Plan. To accomplish this task in the next year, seven workgroups were established:

1. **Community-Based Activities**

   Individuals with asthma and their families expect and should receive appropriate high quality asthma self-management education and support at the time of diagnosis and throughout their lives. The community-based work group focused on community education/awareness in *Addressing Asthma: a Comprehensive Approach and Asthma in the Educational Settings*.

2. **Data and Surveillance**

   Data is important to help tell the story of asthma in Washington State and assist in identifying needs. The workgroup focused on improving our understanding of asthma and providing information on its impact on children and adults living in Washington State. It focused on identifying needs and selecting data for The Burden of Asthma in Washington State report and provided input to the plan on data and surveillance needs.

3. **Health Care and Practitioner Support Group**

   This group focused on promoting and engaging providers in delivering quality care, state of the art knowledge of asthma prevention, diagnosis, and management critical to increasing asthma outcomes in Washington State. The health care work group focused on health care system needs to improve outcomes for all persons with asthma in Washington State in the *Asthma and Health Care* chapter.

4. **Environmental and Occupational**

   This group worked to increase awareness and education about environmental triggers for asthma and the fact that decreasing those exposures can improve the environment for everyone, especially those with asthma. This work group developed the *Asthma and the Environment* and *Work-related Asthma chapters.*

5. **Policy and Advocacy**

   This group coordinated asthma friendly policy development and established a public policy agenda to aid in decision-making about asthma prevention and control. Asthma and asthma-related policy recommendations to both governmental and non-governmental entities can help create a better environment for persons with asthma. This group worked with the other work groups on policy and advocacy issues throughout the plan.

6. **Asthma Plan Project Team (APPT)**

   This special committee appointed by the WAI steering committee to provide overall plan guidance and direction to the five committees in developing a statewide strategic plan to address the increasing health and economic burden of asthma in Washington State. The APPT consists of chairs from each of the five workgroups, the WAI steering committee, the DOH Asthma Program Coordinator and local asthma coalition members.

Development of the plan resulted from an extensive review of materials, some of which included:

- Washington and national asthma surveillance data
- National Heart, Lung and Blood Institute National Asthma Education and Prevention Program and other global standards of care/guidelines
- Healthy People 2010 objectives
- Action Against Asthma: A Strategic Plan for the Department of Health and Human Services
- Strategies for Addressing Asthma within a Coordinated School Health Program, With Updated Resources
- National Asthma Training Curriculum and other educational materials,
- Current research on asthma
- Health Disparity and Environmental Justice Reports developed by the Washington State Department of Health; Other state asthma plans, and
- WAI Annual Summit Recommendations.

The plan was circulated twice within the WAI and among local asthma coalition members and other asthma/asthma-related stakeholders, including those who were not actively part of the WAI. The Plan was developed through statewide collaboration and has resulted in a comprehensive 10-year strategy to improve the prevention, diagnosis, and management of asthma for all persons with asthma in Washington State.

WAI Structure

The WAI steering committee was created in 1997 through support of the American Lung Association of Washington. Members on the steering committee serve two- year terms and are governed under by-laws developed in 2004. WAI serves as a the coordinating body providing overall direction to the development and implementation of State Asthma Plan activities and other asthma-related activities in Washington State. The WAI actively engages stakeholders statewide on asthma through communication and coordination with local asthma coalitions, local and statewide governments, environmental, educational and medical institutions.

Yearly Work Plan Development and Implementation

In April 2005, the Asthma Plan Project Team prioritized the objectives in each of the five main plan chapters (Community Based Activities, Health Care, Environment, Schools, Work-related) within the state asthma plan. These prioritized objectives drive the implementation plan.

Each year at its annual summit, the WAI will develop a yearly work plan that will incorporate the prioritized state asthma plan objectives and other strategic activities. New surveillance, community recommendations, study and/or assessment data will be evaluated in the development of the new work plan.

As part of the ongoing process of plan implementation, the WAI will evaluate membership strengths, satisfaction and organizational success in fulfilling its mission and determine course corrections and new activities as needed. Recruitment, retention, membership and collaboration with statewide and local asthma stakeholders will remain an ongoing process.

Capacity Building

The WAI will continue to explore ways to fund and sustain activities in Washington which include:

- Developing public/private partnerships
- Advocating for state and local funding
- Supporting and extending asthma research and clinical excellence in the community
- Disseminating and sharing successful findings with throughout the state and with other states
- Marketing successful programs, and
- Increasing core constituency membership.

Communication and Coordination

Activities of the Washington Asthma Initiative to implement the state plan are coordinated through the WAI and two lead organizations, the ALAW and DOH. As lead partners they assist with providing communication and coordination for the WAI steering committee and some coordinating assistance to the WAI standing committees.

The ALAW manages a website for the WAI. The site is housed on the ALAW's main website that provides asthma information/resources and updates, a calendar of events and a bulletin board. DOH provides monthly e-news updates to WAI members and other interested persons that provide information on local activities, training and educational events, new articles or resources and planning and implementation updates. In 2005-06, the DOH will also launch an asthma website and distribute quarterly surveillance data updates on asthma and asthma-related topics.

Evaluation

Evaluation is an important element in plan implementation. It has become the reality that both private and public programs and services are undergoing critical review to assure efficiency. Programs and services that can demonstrate effectiveness are more likely to successfully compete for scarce resources than those that cannot.[1] Obtaining and maintaining funding is critical to adequately addressing asthma in Washington State. Showing effectiveness is not limited to seeking or maintaining funding; it is most important to the overall health of Washington citizens by ensuring that the lives of people with asthma in Washington are improving.

1 Washington State Department of Health. (1993). Ed. Manchester Harris AE. Program Planning in The Washington State Responds to AIDS. Olympia, WA.

Effective programs normally have one element in common; an unwavering commitment to the prevention and management of the disease including an ongoing evaluation process. In order to show that tasks are being accomplished, evaluation must be an integral part of work plan development, implementation and follow up. Evaluation can assist decision-making by individuals and organizations, better serve the people with asthma, and provide a mechanism of feedback regarding accomplishments.[2] Evaluation results are continuously fed back into the program planning and implementation process to improve effectiveness and efficiency.[3]

An overall multiple year evaluation plan based on the CDC finalized *Asthma Component for Evaluation 101 Manual*, the *Washington's Steps to a HealthierUS Evaluation Plan* and/or other evaluation manuals should be developed by the steering committee in the first year of the plan. Yearly evaluation and benchmarks will be established on a yearly basis along with the yearly work plan. Progress will be reviewed at the end of each planning year.

2 Washington State Department of Health. (1994). Ed. Manchester Harris AE. Program Planning: Part V in The Washington State Responds to AIDS. Olympia, WA.

3 Centers for Disease Control and Prevention. (2005) Draft Asthma Component for Evaluation 101 Manual Blue Pages.